# Working in Maya

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# 1 Understanding Maya

Maya is rich with features for creating professional 3D animation. Regardless of your animation experience, you'll find abundant tools and techniques to suit your artistic desires. An understanding of the Maya interface is essential to developing a work style tuned to your preferences.

This chapter includes these introductory topics:


- "Starting and exiting Maya" on page 3
- "Understanding the Maya window" on page 4
- "Hiding elements of the Maya window" on page 6
- "Working with window options" on page 9


## Starting and exiting Maya

You can start and exit Maya from the desktop or in a UNIX command line.

### *To start Maya from the desktop:*

1 Double-click the Maya icon:

2 The Maya window appears. The Maya icon changes to this icon when Maya is running:

### *To start Maya from a UNIX command line:*

1 Enter **maya**.

2 The Maya window appears.

### *To exit Maya:*

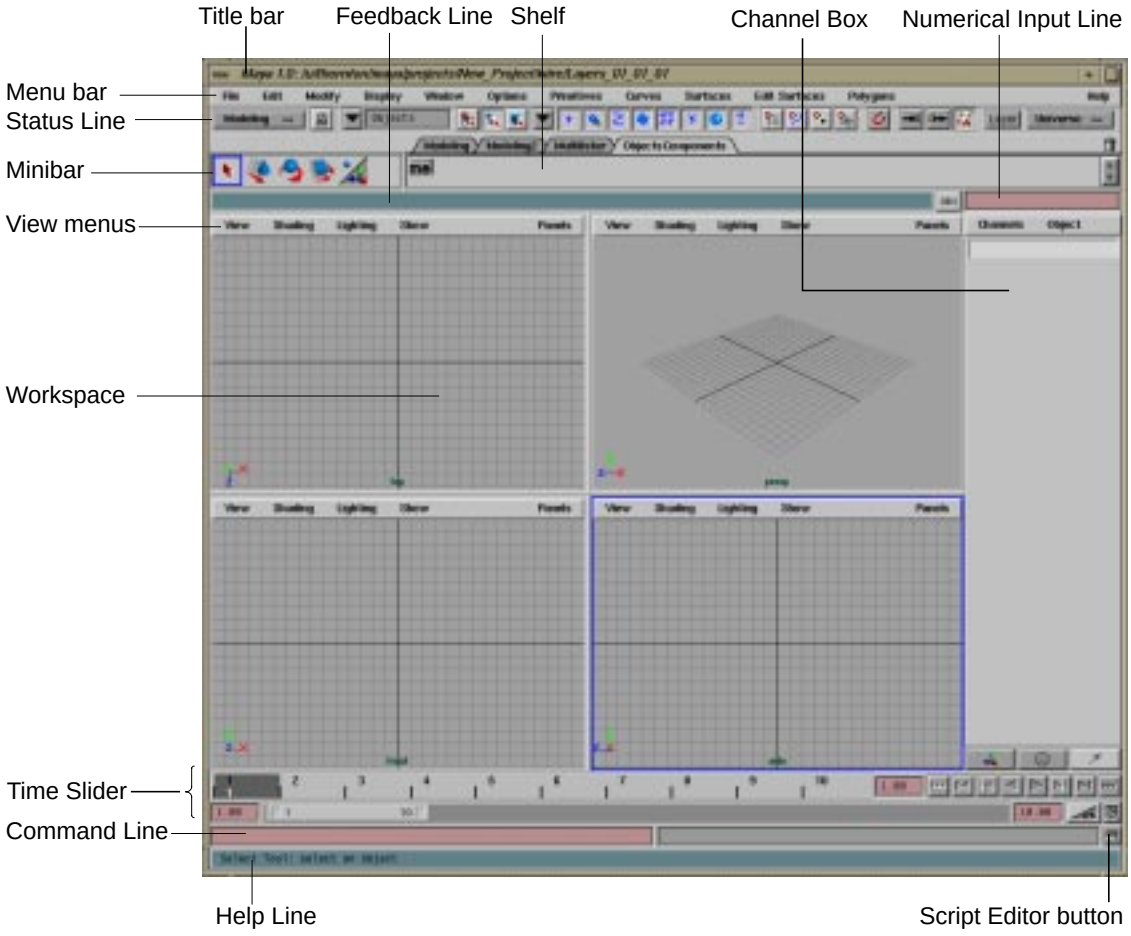
1. Select **File** → **Quit**.

   If you haven't saved the scene, you'll be prompted to save the scene.

2. Click **Yes** to save the scene and exit or **No** to exit without saving.

# Understanding the Maya window

The following figure shows the Maya window—the hub of your animation work. The items in the figure are summarized in the table that follows.



| Window item | Purpose |
|---|---|
| Title bar | Shows the version of Maya, project name, scene, and selected object. For details on projects, see “Managing your Projects” on page 195. |
| Menu bar | Provides menu items. See “Main menu bar” on page 17. |
| Status Line | Displays icons, buttons, and other items pertinent to workspace operations. Also displays the menu selector that specifies which menus appear in the menu bar. See “Using the Status Line” on page 20. |
| Shelf | Shows commonly used tool icons for easy access. You can customize shelves to include the tools of your choice. See “What are shelves?” on page 79. |
| Minibar | Displays icons for these tools from left to right: **Select**, **Move**, **Rotate**, **Scale**, and **Show Manipulator**. See Chapter 11, “Transforming Objects.” |
| Numerical Input Line | Lets you enter exact transformation values from the keyboard. See “Numerical Input Line” on page 53. |
| Feedback Line | Gives information about a selected object as you use certain tools, for instance, **Select**, **Move**, **Rotate**, and **Scale**. See “Feedback Line” on page 52. |
| View menus | Provides menu items specific to the workspace view below the menu. See “The View Menu” on page 273. |
| Workspace | Displays one or more views of the scene: top, perspective, front, and side. See “What is a view?” on page 58. |
| Command Line | Lets you enter MEL commands instead of using the user interface. See “Command Line” on page 53. |
| Help Line | Gives simple instructions as you use many tools and features. See “Displaying help” on page 7. |
| Time Slider | Displays animation playback controls. See *Using Maya: Animation*. |
| Channel Box | Lets you enter attribute values precisely. See Chapter 13, “Working with General Editors.” |

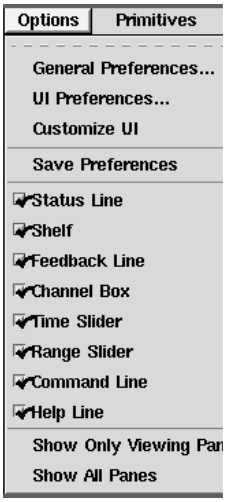
| Window item | Purpose |
|---|---|
| Script Editor button | Displays a window that lists error messages and lets you enter MEL commands. See *Using MEL* for details. |

## Hiding elements of the Maya window

You can hide elements of the Maya window to simplify its display. For example, you can hide the display of the Command Line.

### *To hide an element of the Maya window:*

1 From the **Options** menu, turn off the checkbox of your choice.




For example, turn off **Options** → **Command Line**.

2 The element no longer appears in the Maya window.

## Displaying menus as separate windows

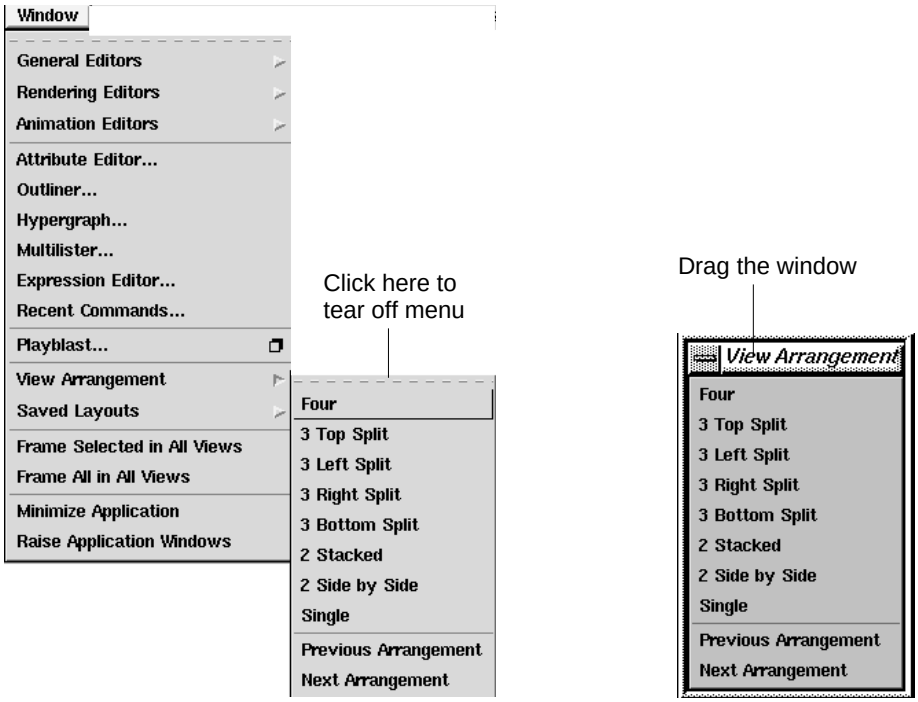
You can display menus as separate windows. This is helpful when you use a menu repeatedly.

### *To display a menu as a separate window:*

1 Click the dotted line at the top of the menu.

The menu appears as a separate window.

2 Drag the window to a new position.




When you tear-off a menu, the main Maya window pops to the front. Other Maya windows (except torn-off menus) are pushed to the back. To move the other windows to the front, select **Window** → **Raise Application Windows**.

# Displaying help

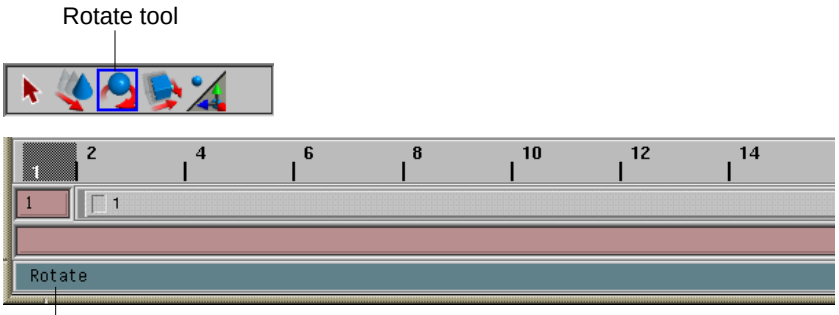
There are two ways to display helpful information as you work: the Help Line and the online documentation. The Help Line displays the name of tools and actions, and gives brief instructions as you use many tools or selections.

The online documentation displays the Maya user guides in HTML format. The online documentation provides a handy search mechanism for finding words throughout the entire Maya documentation set.

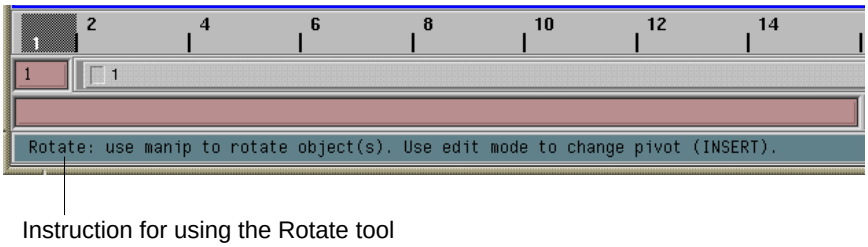
### *To use the Help Line:*

Move the mouse pointer over an icon or button.

The Help Line displays the name of the tool or action associated with an icon or button. Here's an example:




After you select a tool or action, the Help Line explains what you need to do next. If you click the Rotate tool, for instance, the following instruction appears:




If you use a tool with a modifier key, the Help Line displays the purpose of the modifier key. For information on using tools with modifier keys, see Chapter 11, "Transforming Objects."

### *To display the online documentation:*

1. Select **Help** → **Help**.

   This starts a web browser that displays links to Maya user guides.

2. Click the desired topic.

   ***or***

   Click **Search Engine** to search for a word or text string.

***To display the version and release date of Maya:***

Select **Help** → **Product Information**.

***Note***

If errors appear in the console window when you use the online documentation, enter the command *which netscape* in a UNIX shell to see if the correct version of your web browser is running. If incorrect, set the PATH environment variable to the correct location.

# Working with window options

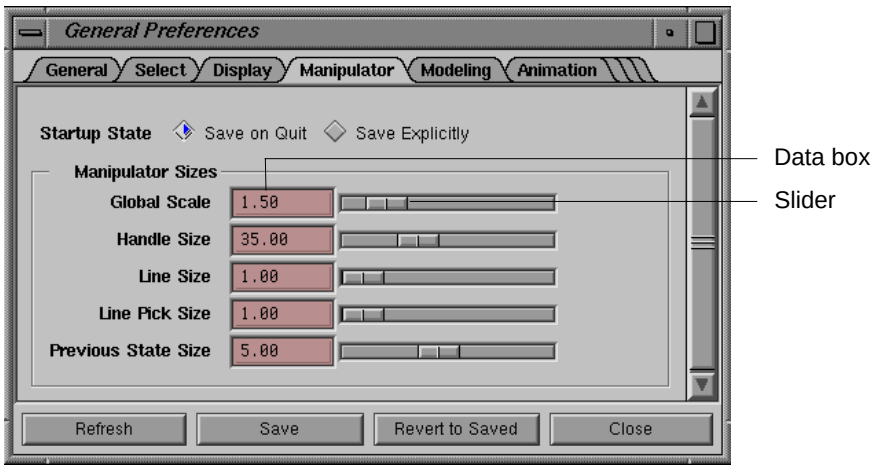
Maya windows have buttons, sliders, data boxes and other features that let you set options. The following topics describe option features you'll encounter throughout Maya.

## Using sliders and data boxes

Many windows have sliders and data boxes for changing the numerical value of options. Most sliders have corresponding data boxes that let you set the slider value from your keyboard. If you type a value in an data box, remember to press Enter.

***Example***

1 Select **Options** → **General Preferences** → **Manipulator.**



2 Drag the **Global Scale** slider bar to change the value.

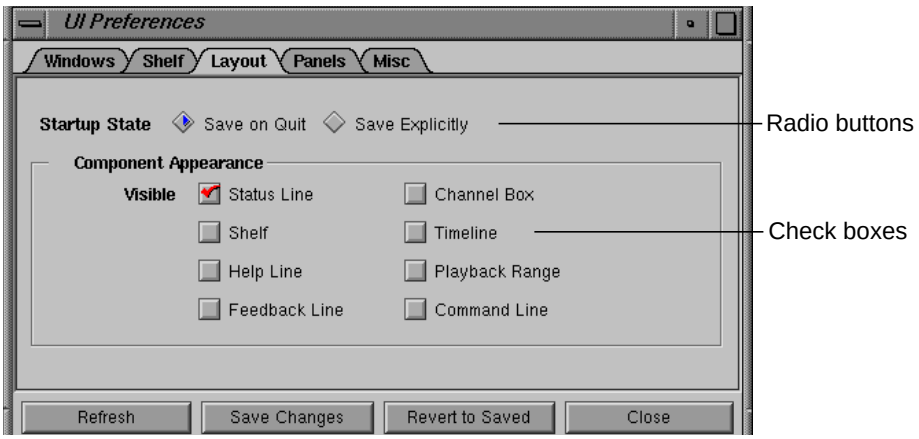
3 Enter a different value for **Global Scale** in the data box.

The slider changes position according to the value you entered.

4 Click **Save or Close**.

## Setting check boxes and radio buttons

Many windows have check boxes and radio buttons. Check boxes let you turn multiple selections on or off. Radio buttons let you choose one option from several choices. When you turn on a radio button for an option, the others turn off.



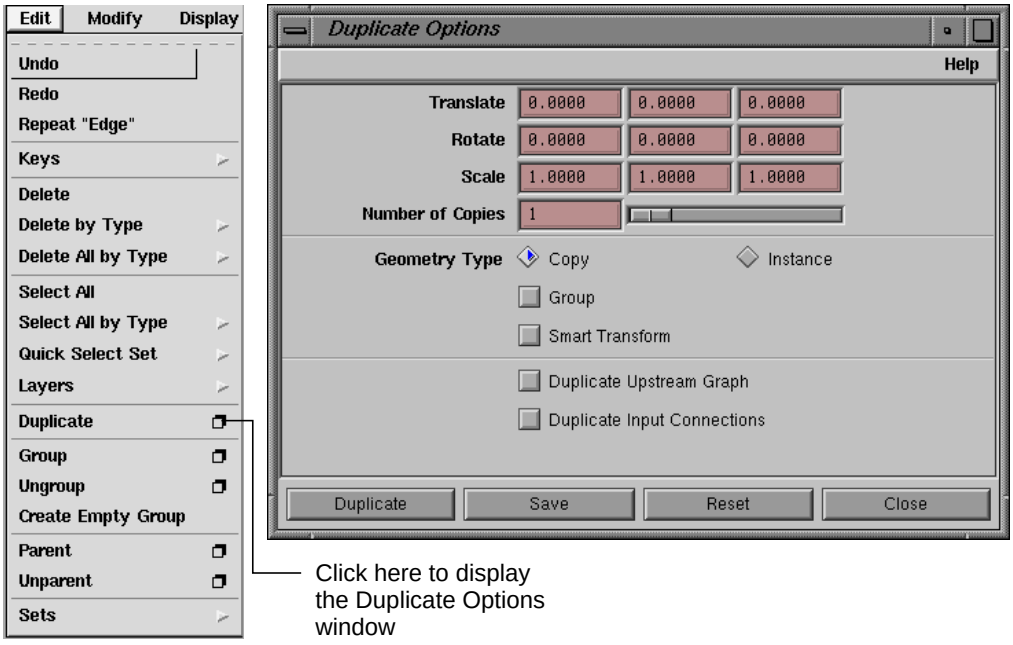

## Selecting menu item option boxes

To the right of some menu entries is a shaded square (❒) called an option box. You can select the shaded square to display a window that lets you specify the menu item's operation.

### *Example*

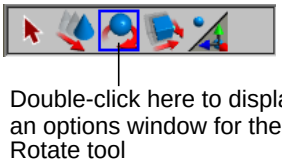
Select **Edit** → **Duplicate**-❒.

The following options window appears:




You can also double-click icons on the Maya window's Minibar to display an options window for the tool represented by that icon.

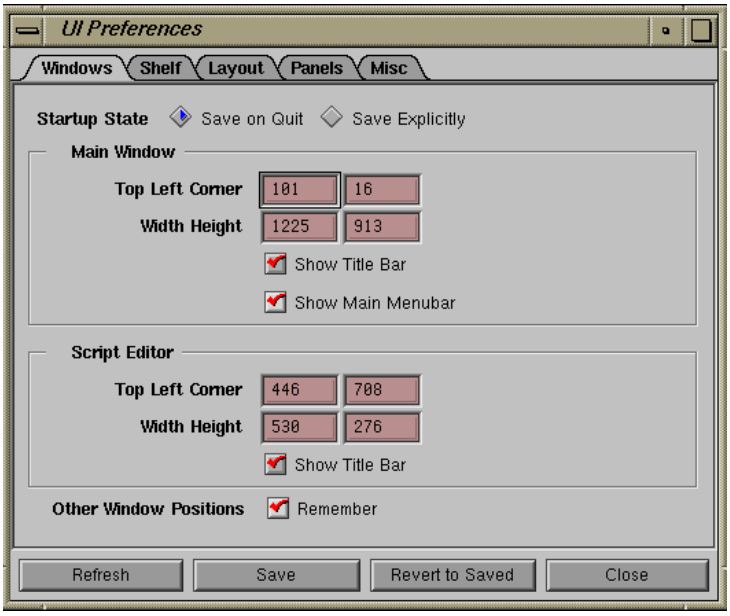
For instance, if you double-click the following icon in the Minibar, Maya displays an options window for the Rotate tool:




Note that the right-most part of the Minibar displays the icon for the active tool or last tool or menu entry in use. Only some Maya menu entries have icons, so this part of the Minibar is often empty.

## Saving and restoring window options

Many windows have buttons you can use to restore or save your option selections. The following example shows four common buttons:




**Refresh** If you change a number in a data box but haven't pressed your keyboard's Return key or changed another option setting, you can click **Refresh** to return the box to its prior value.

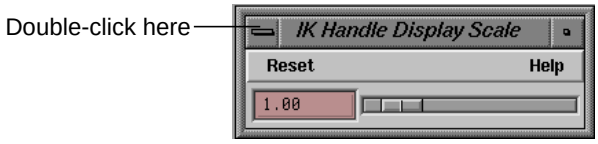
**Save** Accepts your changes and saves them for future use of the window.

**Revert to Saved** Returns settings to the previously saved settings.

**Close** Accepts your changes, but doesn't save them for future use. For more information, see "Setting the Startup State" on page 126.

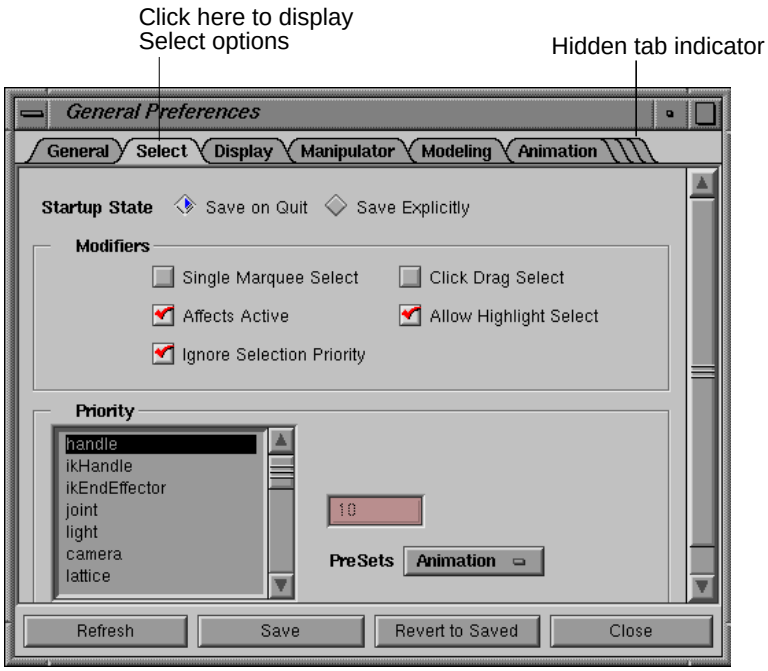
**Reset** Returns settings to original Maya settings. **Reset Tool** also does this.

A few windows don't have Save or Close buttons.To close these windows, double-click the icon in the upper left corner.




## Displaying window tabs and sections

Many windows have multiple pages called tabs. For example, if you select **Options** → **General Preferences**, the General Preferences window displays several tabs. When you click a tab, Maya displays options specific to the tab.



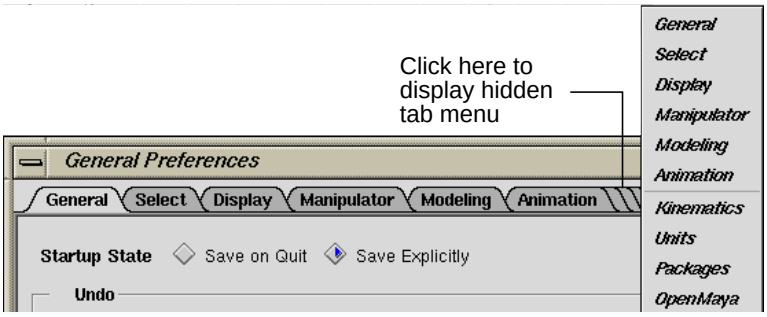

If a hidden tab indicator appears to the right or left of the tabs, the window has other tabs that are hidden in the window.

### *To display hidden tabs:*

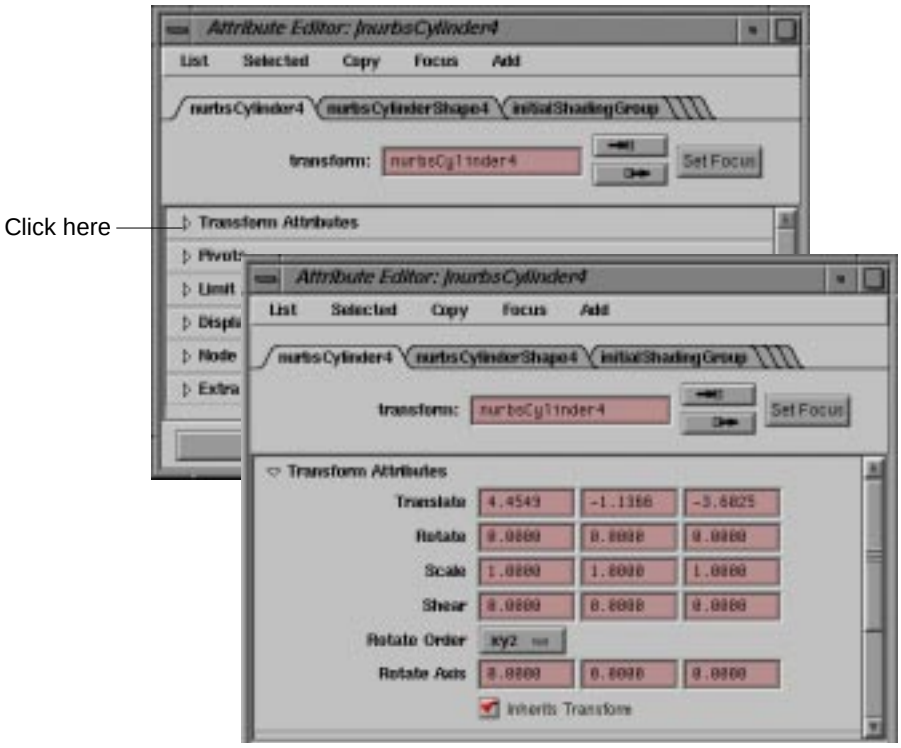
Drag a side or corner of the window to expand its width.

***or***

Click the hidden tab marker and select a tab from the menu that appears.




Some windows have sections marked by triangles. You can click a triangle to expand or collapse the section's contents. In the following example, clicking the triangle beside the Transform Attributes section displays options for moving, rotating, or scaling an object.



# 2 Using Maya

This chapter describes some of the more general workflows in using Maya.

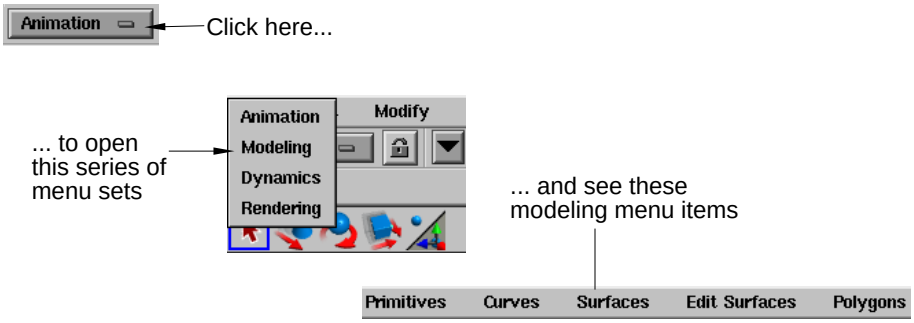
The following topics are described in this chapter:


- "Selecting a menu set" on page 15
- "Main menu bar" on page 17
- "Using the Status Line" on page 20
- "Marking menus" on page 22
- "Hotkeys and marking menus" on page 24
- "Hotbox" on page 25
- "Hotkey Editor" on page 41
- "Feedback Line" on page 52
- "Numerical Input Line" on page 53
- "Command Line" on page 53
- "Playback Range" on page 54


## Selecting a menu set

Maya consists of four basic menu sets: **Animation**, **Modeling**, **Dynamics**, and **Rendering**. Each menu set contains a series of menu items with a variety of tools.

When you start Maya, the default menu set is Animation. To change menu sets, click on the Animation button under the main menu and select a new menu set from the pull-down menu. The menu items change depending on the menu set selected.




### *Animation*

Use the Animation menu set to create character animation with Keying, motion paths, and inverse kinematics. For more information, see *Using Maya: Animation*.

### *Modeling*

The Modeling menu set gives you tools for polygonal and NURBS modeling. For more information, see *Using Maya: Modeling*.

### *Dynamics*

Use the Dynamics menu set to create particle emitters and fields. You can also define objects as soft or rigid, then let them interact in a simulation environment. For more information, see *Using Maya: Dynamics*.

### *Rendering*

Use the Rendering menu set to add and refine scene lighting, shading, and special camera characteristics. It provides both hardware and software rendering. For more information, see *Using Maya: Rendering*.

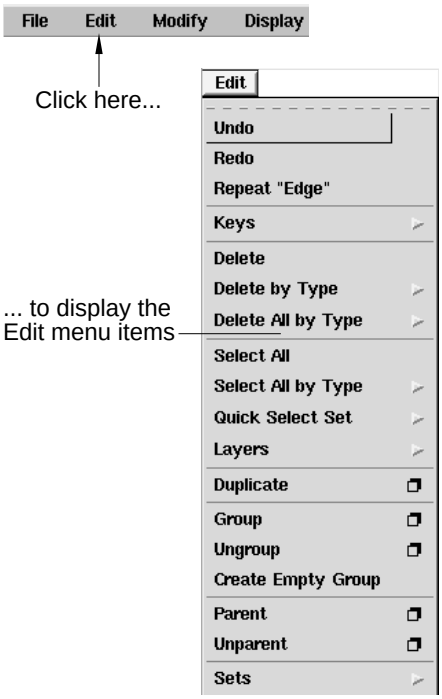
# Main menu bar

The main menu bar is located along the top of the Maya window. It contains common menu options as well as a menu set that is determined by the menu set you select.

The common menu options are **File**, **Edit**, **Modify**, **Display**, **Window**, **Options**, **Tests**, and **Help.** These menu items display regardless of the menu set you choose.

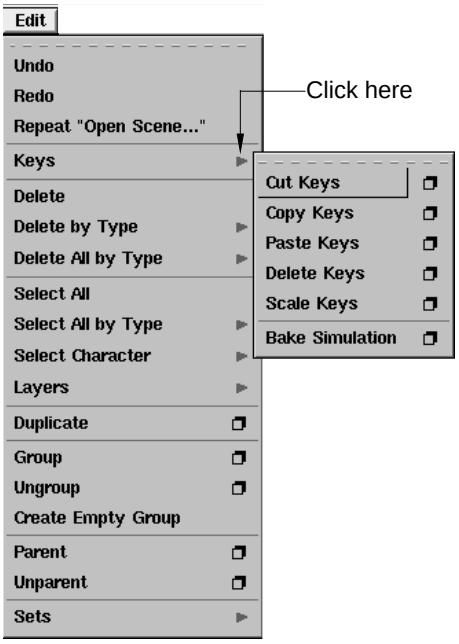
## Selecting a menu

To select a menu, click on its title to open its pop-up menu.



## Viewing a sub-menu

If Maya displays a right-pointing triangle to the right of the menu item, a sub-menu exists for that item. This is called a hierarchial *or cascading* menu. To view the sub-menu, click on the arrow.

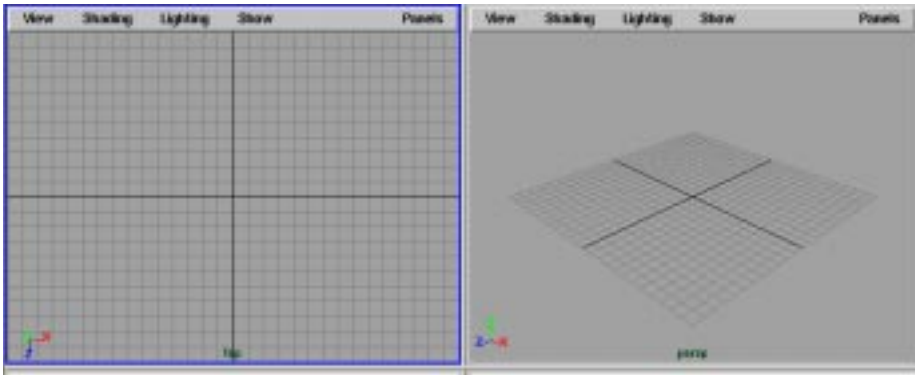



## Opening an options window

Some menu items have an options box (❐) to the right of their names. If you click the options box, Maya opens an options window where you can change default settings for a tool or action.

## View menus

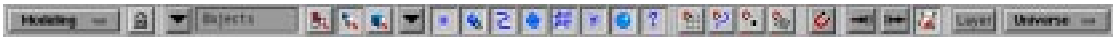
In addition to the main menu bar at the top of the Maya window, each of the views has a menu bar. This is called a *view menu*.



- **View**—Select a camera, view or bookmark. You can also edit various camera attributes for that view, including the angle of view, focal length and film back properties. For more information, see Chapter 3, “Viewing your scene.”
- **Shading**—Select shading, specify shade options, and select hardware texturing. For more information, see “The Shading Menu” on page 276.
- **Lighting**—Set lighting options. For more information, see “The Lighting Menu” on page 279.
- **Show**—Specify which object components to display. For more information, see “The Show Menu” on page 280.
- **Panels**—Select views, layouts, and panels. You can also edit panels and tear off menus.

  For more information, see “Assigning panels” on page 172, “Laying out the views” on page 67, and “Displaying menus as separate windows” on page 6.

# Using the Status Line



The Status Line

The Status Line provides feedback on settings that affect the way the tools behave. The displayed information consists of:

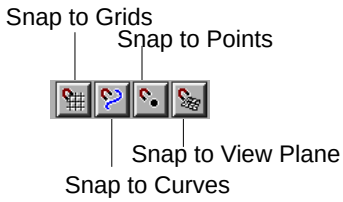
- the current menu set,
- the selection mode and selectable items,
- the snap mode, the history of the selected lead object (visible by pressing the input and output buttons),
- the construction history flag, and
- the working layer.

To change these settings, press the button or menu that displays the corresponding information. For instance, to change the current menu set, click the current set to display a pull-down menu.

To change selection mode, press the component selection switch (to go in component selection mode) or object selection switch (to go in object selection mode).

For more information on changing selection mode, please see “Limiting object and component selection” on page 240. For information on locking a current selection, see “Locking a transform tool or manipulator” on page 250.

### *Snapping buttons*




**Snap to Grids** Snaps a CV or pivot point of a selected object to a grid corner.

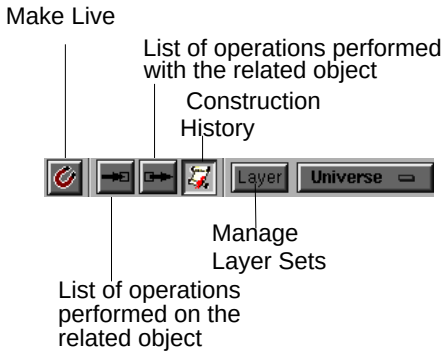
**Snap to Curves** Snaps a CV or pivot point of a selected object to a curve or curve on surface.

**Snap to Points** Snaps a CV or pivot point of a selected object to a point.

**Snap to View Planes** Snaps a CV or pivot point of a selected object to a view plane.

For more information on these snapping modes, see “Snapping with the Move Tool” on page 286.

### *Other buttons*




**Make Live** Makes the selected object “live”. After making a surface “live,” you can create curves on surface on it.

For more information, see “Using Make Live” on page 311. For more information on drawing a curve on surface, see *Using Maya: Modeling*

**Operations performed on selected object** Clicking this button gives you a choice of **Selecting**, **Enabling** or **Disabling** all operations listed, or you can view the appropriate **complete,** historical list.

**Operations performed with selected object** Clicking this button gives you a choice of **Selecting**, **Enabling** or **Disabling** all operations listed, or you can view the appropriate **complete,** historical list.

**Construction History** Turns an object’s construction history on or off.

**Manage Layer Sets** Select a layer. For more information about layers, see “Layering a scene” on page 245.

**Universe** Displays all existing layers.

***Hint***

When you move the pointer over the buttons on the Status line, the Help line displays the name of the button.

# Marking menus

Marking menus let you quickly access various tools and actions. Marking menus are also convenient— you can use them from any part of the Maya workspace.

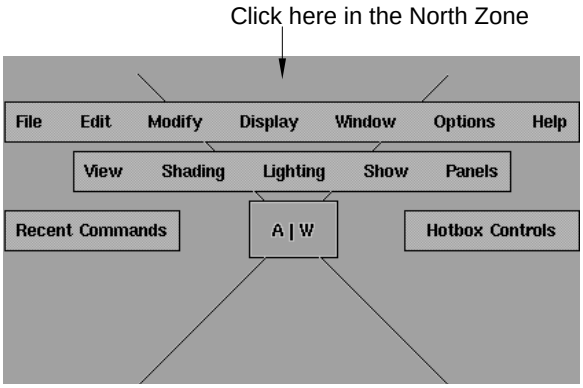
Marking menus are found in many areas within Maya, including:

- In each *zone* in the Hotbox. For more information, see “To use a marking menu in the Hotbox:” on page 22.
- Under hotkeys. For more information, see “To use a marking menu with a hotkey:” on page 23.
- On the right mouse button in different views. For more information, see “To use a marking menu with the right mouse button:” on page 24.

You can customize marking menus to execute commands you have written. For information, see “Customizing a marking menu” on page 98.

### *To use a marking menu in the Hotbox:*

1. Press and hold the spacebar. Maya displays the Hotbox.

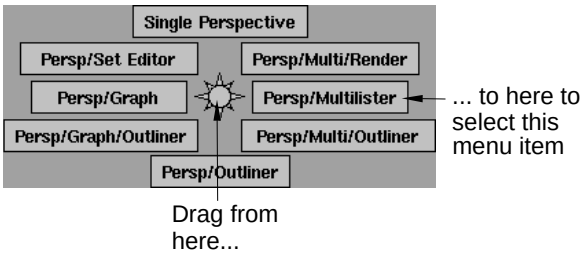


2 Click in the North zone.

***Note***

The menu that displays depends on how you have set up the marking menus. For more information, see “Creating a Marking menu” on page 99.

The following figure appears:




3 To close the marking menu, release the mouse button.

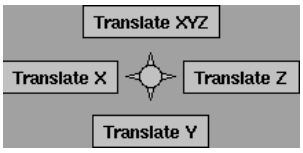
4 To select a menu item, drag the sun icon.

### *To use a marking menu with a hotkey:*

Many hotkeys have an associated marking menu. For example, the hotkey w is associated with the Move Tool.

1 Select an object.

2 Press and hold the w key on the keyboard, then the left mouse button. The following menu appears:




3 Click-drag to select a function.

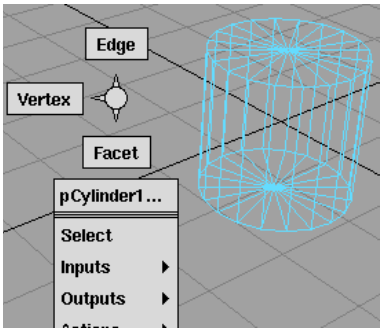
For more information on hotkeys and marking menus, see “Creating a Marking menu” on page 99.

For a list of all hotkeys and their marking menus, see “Hotkeys and marking menus” on page 24.

### *To use a marking menu with the right mouse button:*

The marking menu that appears depends on the type of object you are working with.

If you have not selected an object, press the right mouse button to display a pop-up menu. Choose **Select All**. If you have selected an object, press the right mouse button anywhere in the view. The following tool appears:




# Hotkeys and marking menus

Hotkeys are invoked by pressing the left mouse button.

| Hotkey | Action on Marking Menu |
|---|---|
| a | Select All History / Select All Future |
| d | High / Medium / Low Quality Display |
| e | Rotate X, Y, and Z |
| h | Animation, Modeling, Dynamics, Rendering |
| q | Select Mask |
| r | Scale X, Y, Z and Scale XYZ |
| w | Translate X, Y, Z and Translate XYZ |

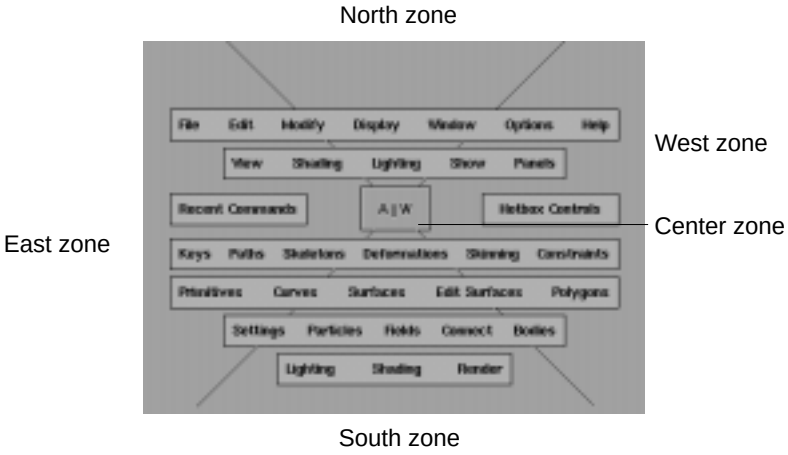
# Hotbox

The Hotbox gives you quick access to all commands found on both the main menu and view menu bars. Press and hold the Space bar on the keyboard; you don't have to use the mouse, Maya displays the Hotbox at the location of the pointer.

***Tip***

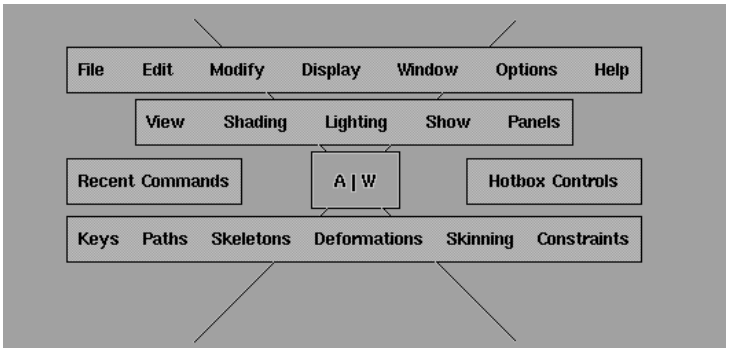
Try using the Hotbox instead of the main menu bar and view menu bars. This lets you turn off the main and view menu bars and gives you more screen space.

The Hotbox has five zones: North, South, East, West, and Center. They are defined by diagonal lines.



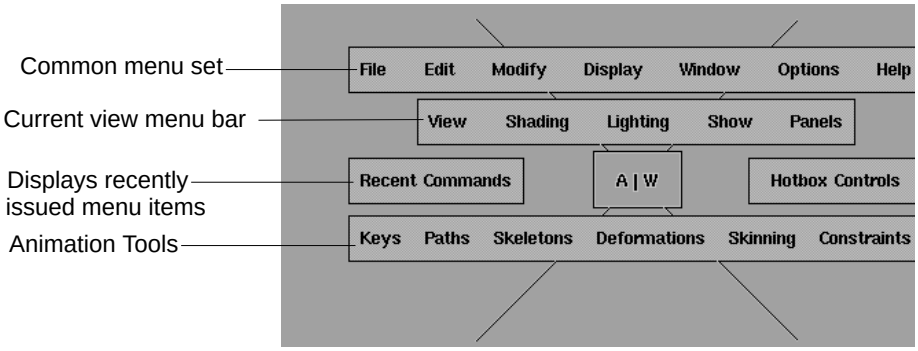

Each zone contains marking menus. Use these menus to change selection masks, control panel visibility, and panel types. These zone menus can be customized. For information on how to do this, see "Customizing a zone" on page 37.

The following illustration shows the Hotbox with the Animation menu options displayed. This is the default setting.




### *To display the Hotbox:*

Press and hold the **Space** bar. The following menu appears:




***Warning***

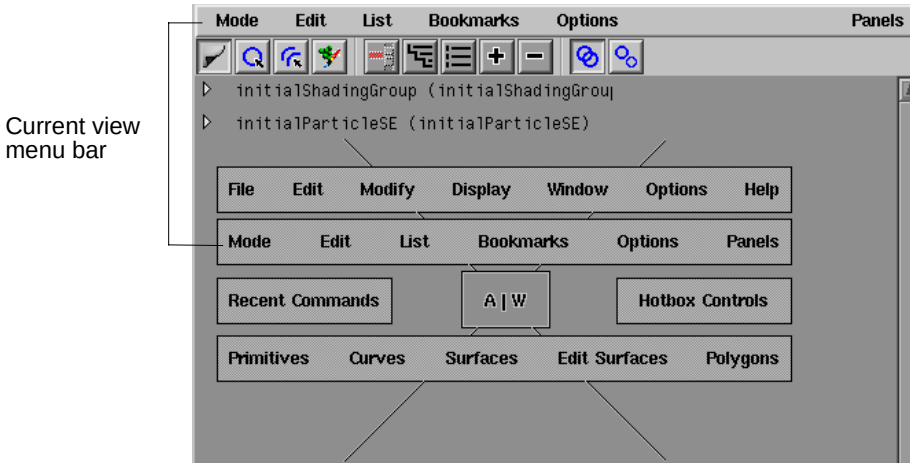
If you press the Space bar but do not hold it down, Maya changes the number of views displayed. For example, if you are in a perspective view, then press the Space bar, Maya displays the four basic views.

**Common menu set**

The main menu items common to all function sets. For more information, see “Main menu bar” on page 17.

**Current view menu bar**

The contents of the view menu bar in the Hotbox depends on which view or window the pointer is in. For example, if the pointer is in the Set Editor window, the view menu bar appears like this:


Current view menu bar
Mode Edit List Bookmarks Options Panels
initialShadingGroup (initialShadingGrou
initialParticleSE (initialParticleSE)
File Edit Modify Display Window Options Help
Mode Edit List Bookmarks Options Panels
Recent Commands
A | W
Hotbox Controls
Primitives Curves Surfaces Edit Surfaces Polygons

**Recent Commands**

This menu displays the last sixteen most recently issued actions. For more information, see “Displaying recent commands” on page 27.

Only commands invoked from the menus in the main menu bar are added to the recent command list. Commands invoked from the command line, the shelf, or any other menus are not added to the list.

***Tip***

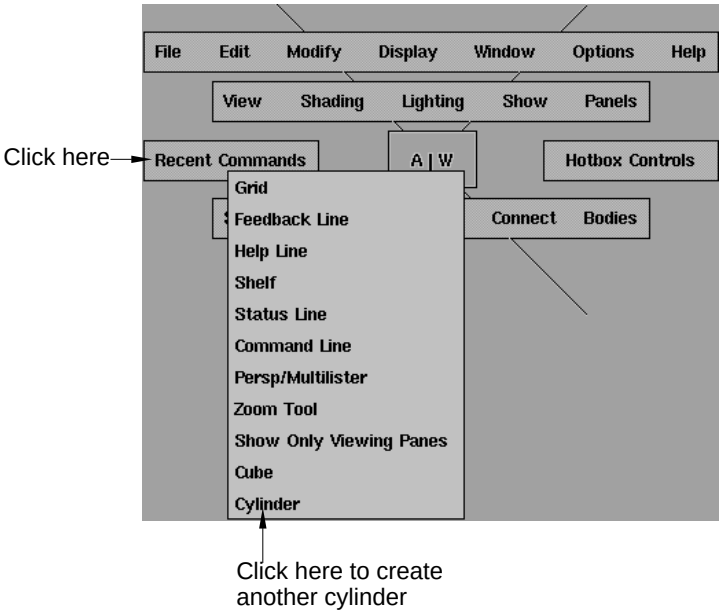
If you want to display more than sixteen previously issued commands, you must use a MEL script. For more information, see *Using MEL*.

**Hotbox Controls**

This menu contains items you use to control the appearance and contents of the Hotbox.

## Displaying recent commands

The Hotbox lets you select up to sixteen previously issued commands. This eliminates the need of having to work through hierarchial or cascading menus.



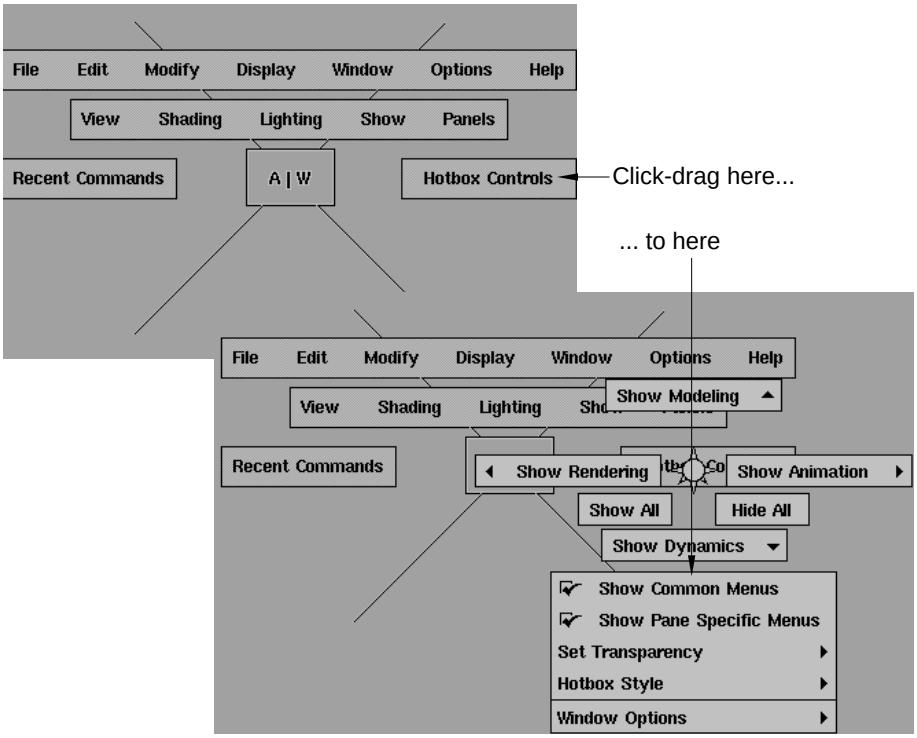

You can now select a command to repeat.

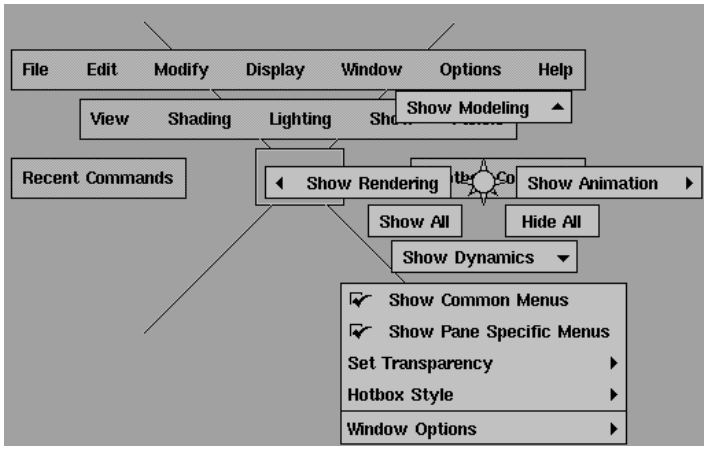
## Changing Hotbox settings

One of the advantages of the Hotbox is that you can change its contents while you are working. With the Hotbox Controls menu, you can change a variety of Hotbox settings. For example, you can specify which function sets you want to display and if you want common menus to display.

### *To change a Hotbox option:*

1 While pressing the Spacebar, click **Hotbox Controls**.



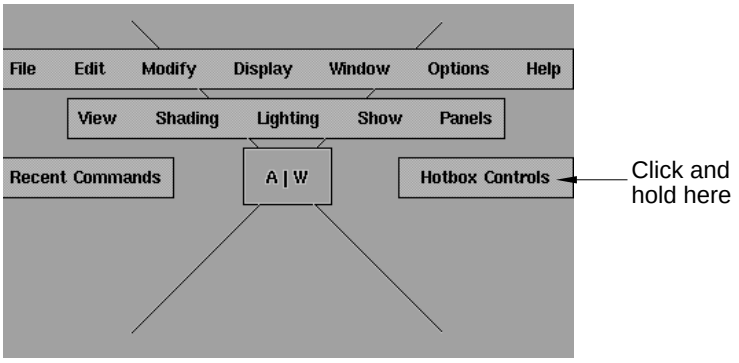

**2** Click-drag an option.

### *To specify what function sets appear:*

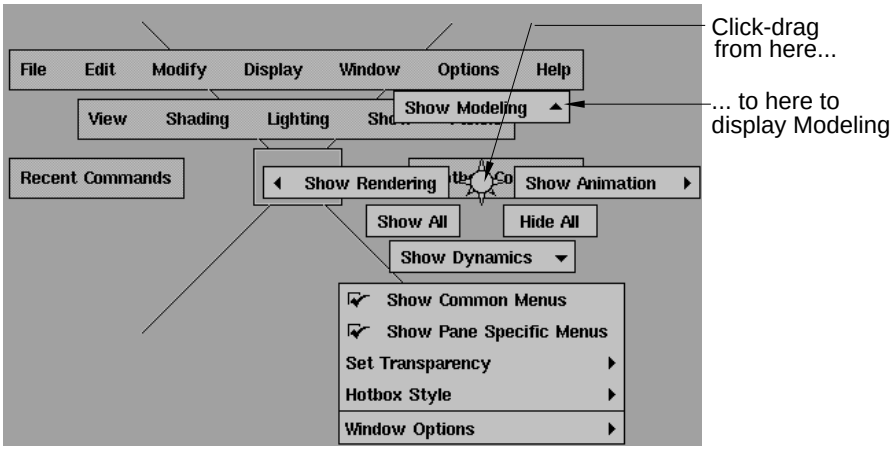
One of the main features of the Hotbox is its ability to display multiple menu items. For example, if you are going back and forth between the Modeling and Rendering function sets, the Hotbox can display all associated menu items.

In the following example, the Hotbox displays the Modeling menu items.

1 Press and hold the Spacebar. The following menu appears:



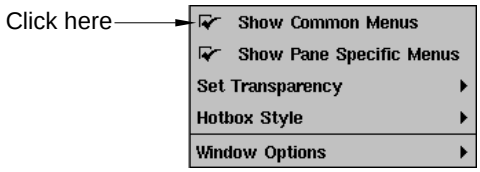

2 With the pointer on Hotbox Controls, click and hold any mouse button. The following menu appears:




3 Drag to the **Show Modeling** menu item.

### To turn off common menus:

By default, common menus appear in the hotbox.

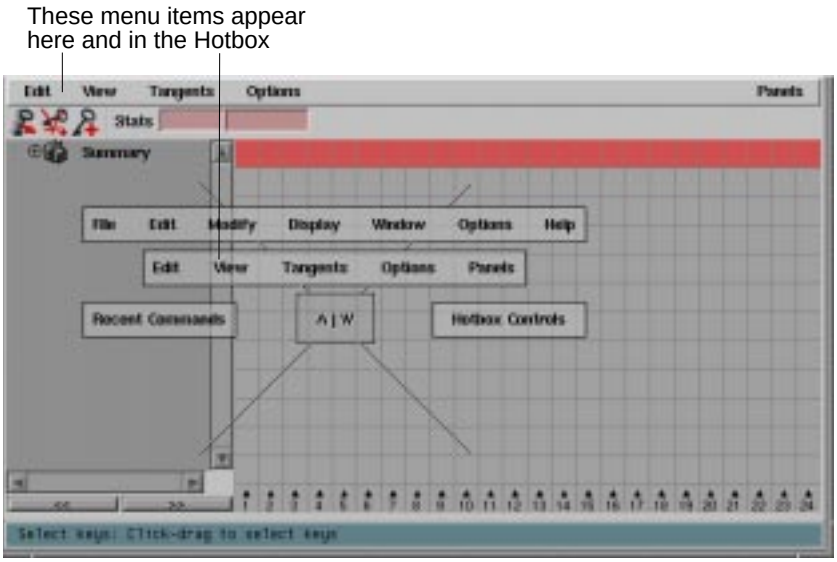



To turn off these menus, click on the box beside **Show Common Menus in the Hotbox Controls menu**.

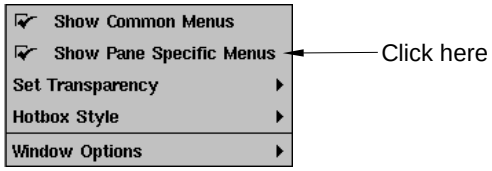
### To turn a view specific menu on and off:

If you do not want the view-specific menus to appear when using the Hotbox, you can turn them off.

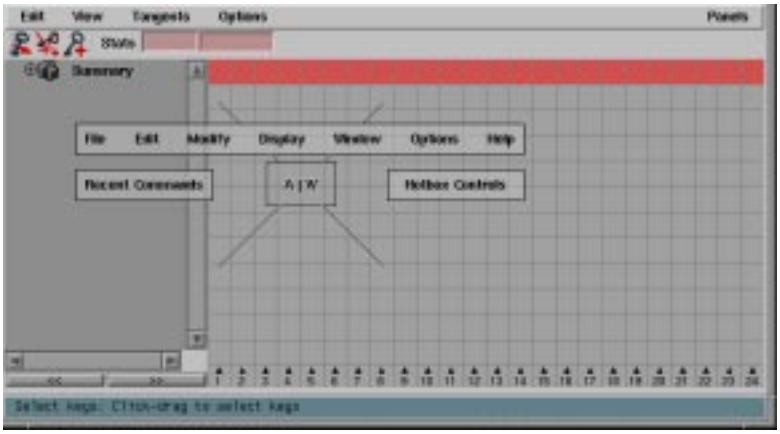
In the following example, **Edit**, **View**, **Tangents**, **Options**, and **Panels** appear twice in the view.




To turn off the menus, click **Show Pane Specific Menus**.




In the following example, **Edit**, **View**, **Tangents**, **Options**, and **Panels** now appear once in the view.



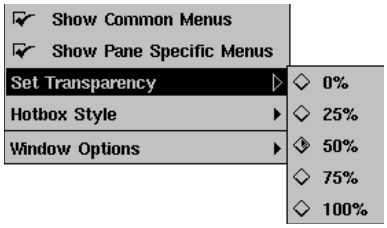
***Note***

You can also do the reverse (turn off the view menus in the view). See “Panels options” on page 148.

### *To change the transparency:*

You can make the Hotbox transparent to minimize the amount of the scene or object it obscures.

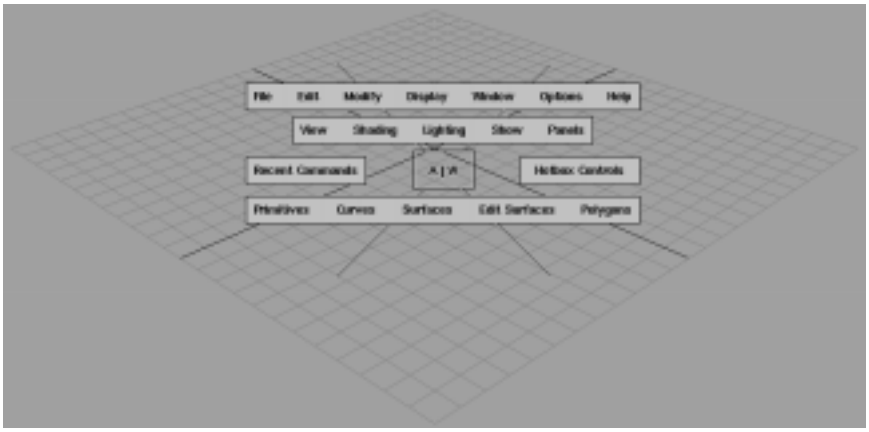
1 Click-drag on **Set Transparency.**




2 Select a new transparency percentage. The default is 50%.

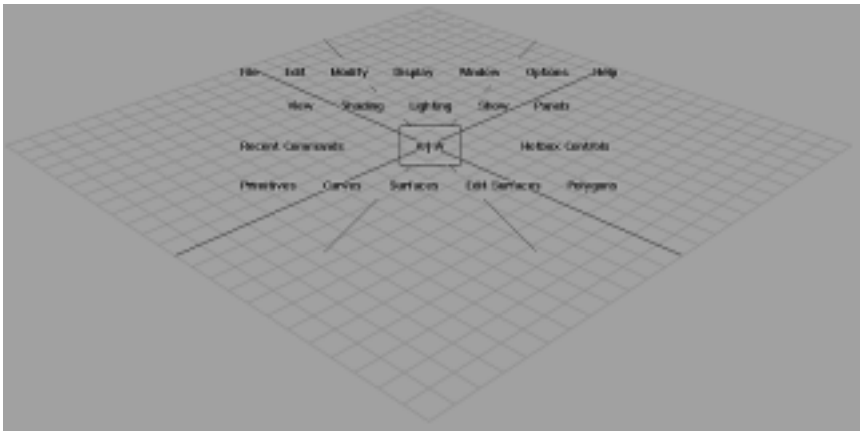
### *Transparency of 0%*

The following shows a setting of 0%. Note that the boxes appear as part of the Hotbox and will partially obscure the scene or object.



### *Transparency of 100%*

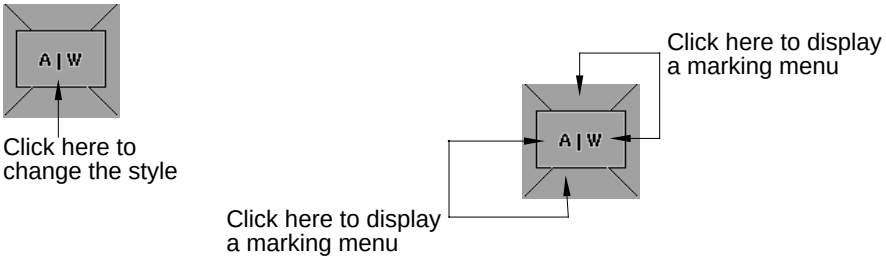
The following shows a setting of 100%. Note that the boxes do not appear as part of the Hotbox. This means that you can still see your object or scene through the Hotbox.



### *Changing the style of the Hotbox*

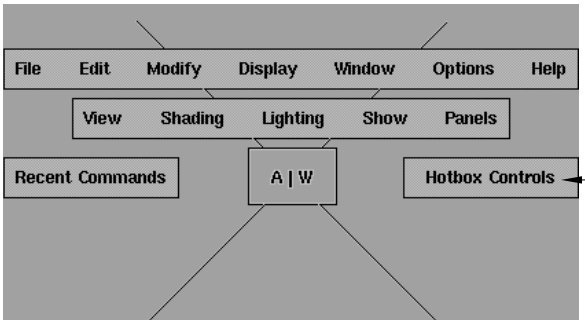
You can use the Hotbox Style Settings to change the display of the Hotbox so that it fits your working style. Select the Hotbox Controls to:

- make all of the menu rows visible
- display just the five marking menu zones
- make the centre zone (A | W) active everywhere

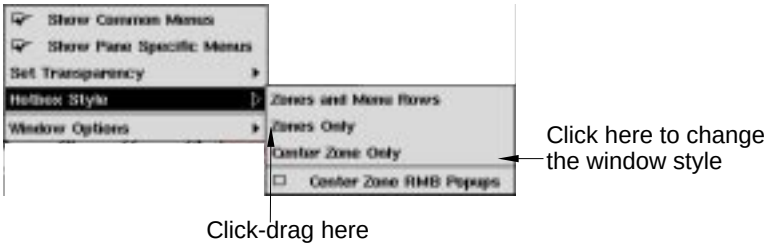



### *To change the style:*

While pressing the Space bar, click-hold on the Hotbox Controls.

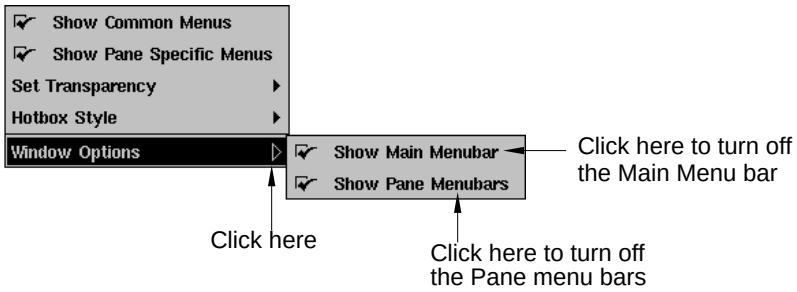



The following menu appears:



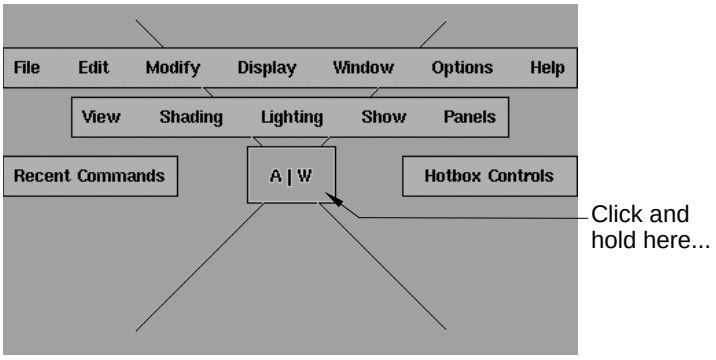

### *To set window options:*

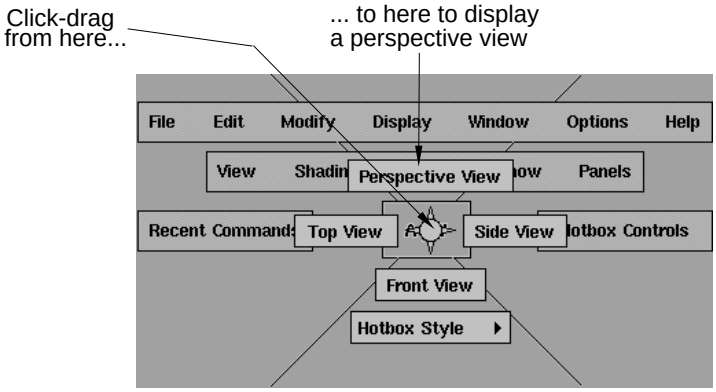
To give yourself more drawing space, you can turn off the Main and Pane menu bars. To do this, press the **Space** bar and select **Hotbox Controls** → **Window Options**. The following cascading menu appears:



## Changing the view

Use the Hotbox to change to another view. While pressing the **Space** bar, click and hold on the Center zone.

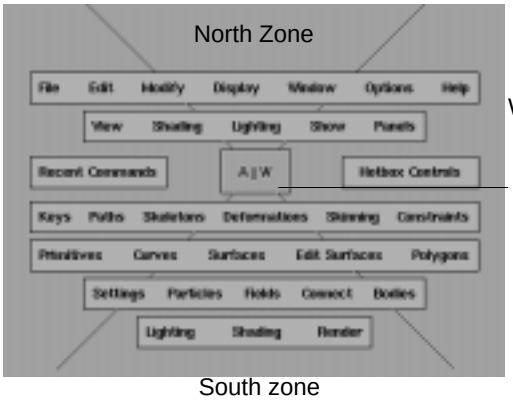


# Customizing a zone

The Hotbox has five zones: North, South, East, West, and Center. Each zone contains marking menus that let you change selection masks, control panel visibility, and panel types.

You can customize a marking menu in the Marking Menus editor. For more information, see “Customizing a marking menu” on page 98.

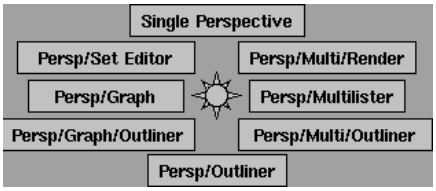



## Default marking menus

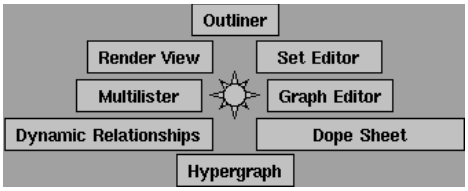
The following marking menus are the default settings for each of the five marking menus.

**North zone**

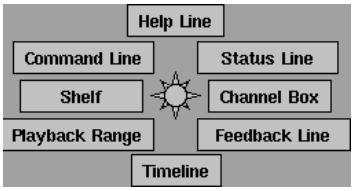
Changes to a new window layout.



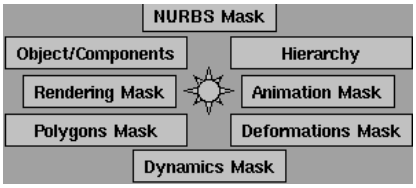
**South zone** Changes a view in the current panel.



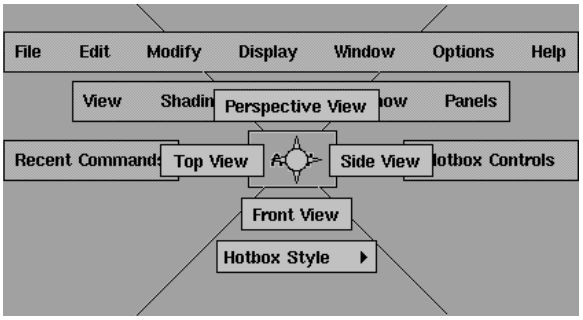

**East zone** Turns parts of the interface display on and off.




**West zone** Switches between preset selection masks.



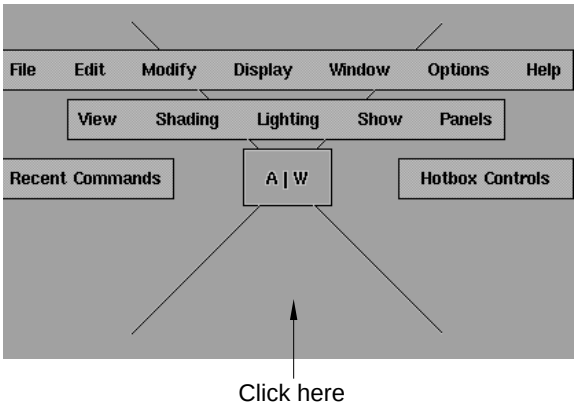

**Center Zone** Switches between views.



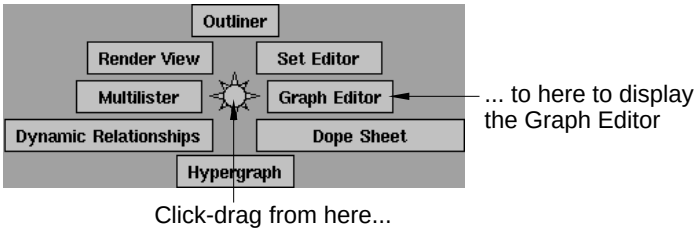
### *To select a menu item from a marking menu:*

In the following example, a tool is selected from the South Zone.

1 While pressing the Space bar, click in the South Zone.




The following menu appears:



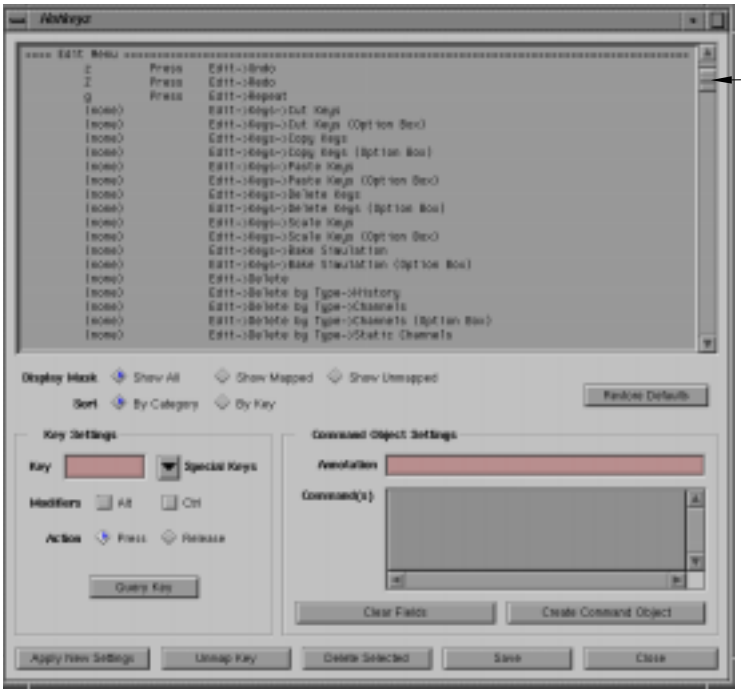

2 From the center of the menu, click-drag to the **Graph Editor**.

# Turning off the hotbox

You can disable the Hotbox so it does not appear when you press the Space bar.

### *To disable the Hotbox:*

1 Select **Options** → **Customize UI** → **Hotkeys**. The following window appears:




2 Under Miscellaneous, select **Pop HotBox**, then **Unmap Key**. Maya removes the word **Press** from the window. This turns off the hotkey functionality.

---

***Note***

For more information on Press and Release, see “Specifying a key event” on page 44.

---

3 Click the **Save** button, then the **Close button**. Now, when you press the **Spacebar**, the Hotbox will not display.

For information on using hotkeys, see “Creating a hotkey” on page 46.

## Editing a marking menu

The Hotbox supports a different menu for each mouse button in each of the five zones. This lets you create three menus per zone, for a total of fifteen marking menus. This gives you approximately 120 commands.

For more information on using the Marking Menu, see “Marking menus” on page 22.

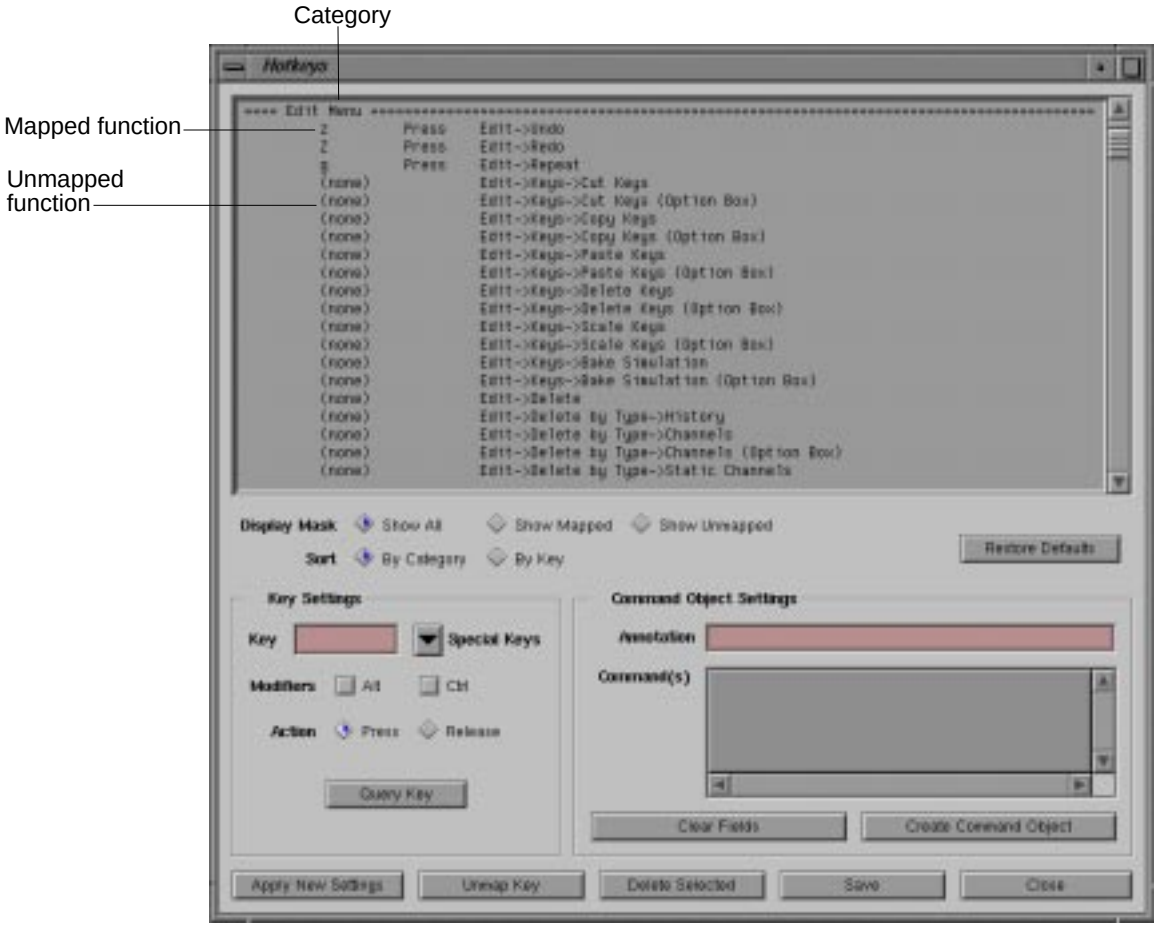
# Hotkey Editor

If you use a function frequently you may want to assign it to a hotkey. For example, if you select **File** → **Import** frequently, you can assign a hotkey to it. This decreases your reliance on the main menu.

The Hotkey Editor lists all the menu items in the main menu bar and many commonly-used functions in Maya. You can use it to assign a hotkey to these functions or your own functions.

### *To display the Hotkeys editor:*

1 Select **Options** → **Customize UI** → **Hotkeys**. The following window appears:




### *Specifying the Display Mask options*

Select a mask option to display either mapped or unmapped main menu functions and their hotkeys.

**Show All** Shows mapped and unmapped hotkeys. Mapped main menu functions appear at the top of the window. Unmapped functions appear after the mapped functions.

**Show Mapped** Shows mapped hotkeys.

**Show Unmapped** Shows unmapped hotkeys.

### *Sorting the Hotkeys*

Select a sorting method.

**By Category** Sorts the hotkeys by category. For more information, see “What are categories?” on page 44.

**By Key** Sorts the hotkeys by key and in alphabetical order. All the mapped functions appear at the top of the window; unmapped functions appear at the bottom.

---

***Note***

If you want to sort all mapped hotkeys by key, select **Show Mapped**, then **By Key**. This also displays which hotkeys have associated marking menus. For more information, see “Assigning a marking menu to a hotkey” on page 113.

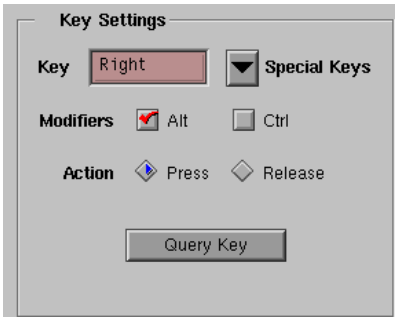
---

### *Specifying a key*

This lets you specify a particular key.

**Key** Enter any letter from A to Z or a number from 0 to 9. You cannot use more than one letter or number.

**Special Keys** Specify a task to other keys on the keyboard. For example, if you want the right arrow key to act as the trigger, specify it here.




### *Specifying a hotkey modifier*

Select either Alt or Ctrl for the hotkey modifier. For example, Alt-B.

#### *Specifying a key event*

Use **Press** and **Release** to associate a function with the press or a release of a key. For example, you can create a hotkey to instruct Maya to snap to a curve when you press a key, then turn off the snapping when you release it.

#### *Setting a Command Object Setting*

If the command you want to associate with a hotkey does not appear in the Hotkey Editor window, you can specify it using a MEL script.

**Annotation** Contains a description used in the Hotkey window.

**Command(s)** Contains the MEL script that makes up the function.

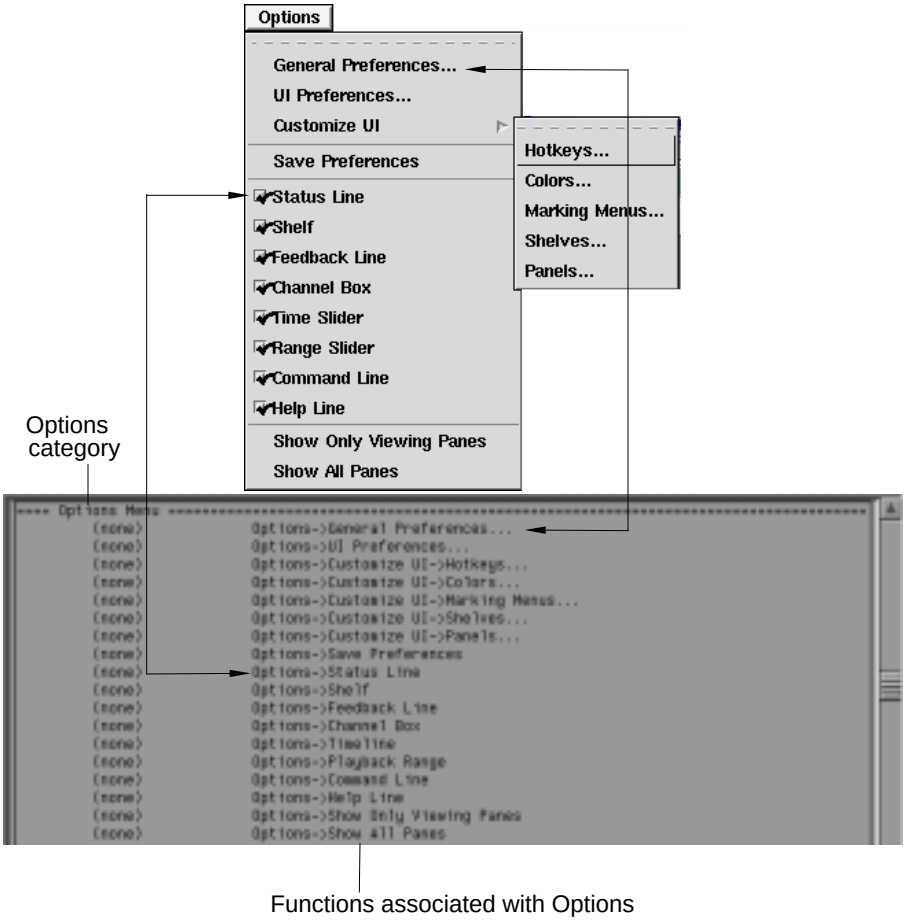
## What are categories?

Maya is made up of four menu sets: **Animation**, **Modeling**, **Dynamics**, and **Rendering**. In addition, there are eight main menu items that remain displayed regardless of the function set you choose: **File**, **Edit**, **Modify**, **Display**, **Window**, **Options**, **Test**, and **Help**.

The Hotkey Editor lists all of the available main menu functions starting with the File menu and ending with Miscellaneous. Each category displays all associated functionality for a main menu item.

#### *Main menu categories*

In the following figure, the Options main menu item and its associated functions are reflected in the Options menu category.




### *User-defined categories*

User-defined categories list all hotkey combinations you have created. It does not include hotkeys supplied by Maya. For example, if you assign a hotkey to a function not listed in the Hotkey Editor, Maya displays it in this category.

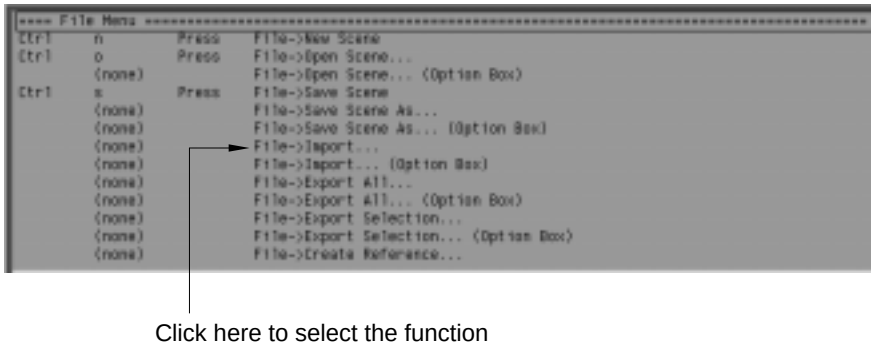
# Creating a hotkey

The Hotkey Editor contains all of the functions found in the main menu. This lets you assign a hotkey to any main menu function you use frequently.

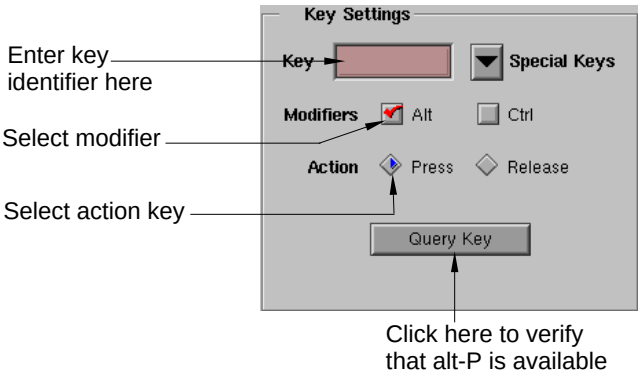
In the following example, the **File** → **Import** function is assigned to the hotkey combination Alt-P.

### *To create a hotkey:*

1. Select **Options** → **Customize UI** → **Hotkeys**.
2. Select **File** → **Import**.

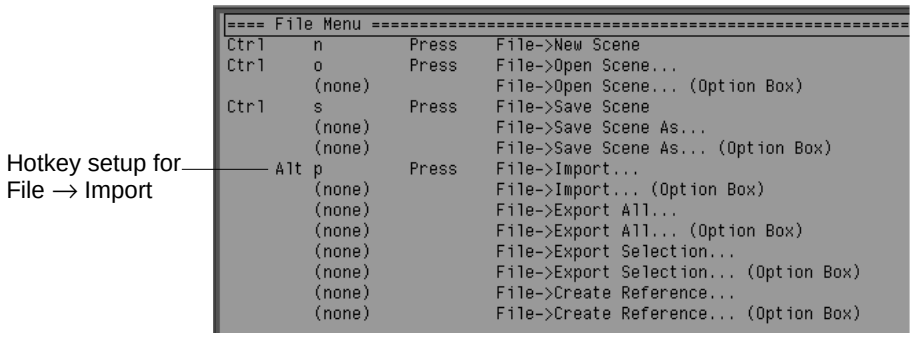



3. In the **Key** box, enter p. This is the key identifier.




4. Select a modifier.

5 Select either **Press** or **Release**, then click **Apply New Settings**. Maya applies the hotkey combination to the main menu function.


Hotkey setup for
File → Import
==== File Menu ==========
Ctrl n Press File->New Scene
Ctrl o Press File->Open Scene...
(none) File->Open Scene... (Option Box)
Ctrl s Press File->Save Scene
(none) File->Save Scene As...
(none) File->Save Scene As... (Option Box)
Alt p Press File->Import...
(none) File->Import... (Option Box)
(none) File->Export All...
(none) File->Export All... (Option Box)
(none) File->Export Selection...
(none) File->Export Selection... (Option Box)
(none) File->Create Reference...
(none) File->Create Reference... (Option Box)

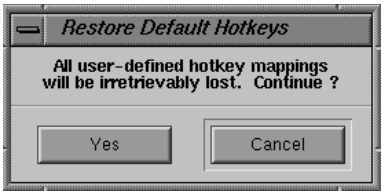
***Hint***

To remove the hotkey mapping from the key, click **Unmap Key**.

### *To restore system defaults:*

1 To restore the main menu functions to their default settings, click **Restore Defaults**.

The following message appears:




2 Click **Yes**. Maya removes all the hotkeys you have assigned to the main menu functions.

## Deleting a hotkey

You can delete any user-defined function menu in the Hotkey window.

***Warning***

You cannot delete any of the default commands from the Hotkey Editor.

You cannot undelete a hotkey once you have deleted it.

### *To delete a hotkey:*

1. Select the function you want to delete.
2. Click **Delete Selected**.

***Hint***

You can delete multiple commands.

## Creating a hotkey for a view menu function

The Hotkey Editor does not contain menu items for the following window view menu bars:

However, you can create a hotkey for these functions with the Script Editor and the Hotkey Editor.

You can also assign a hotkey to a view. For more information on views, see “Creating a layout” on page 180.

You can also use the Hotkey Editor to create your own hotkeys, using MEL commands you write yourself. For more information, see *Using MEL*.

In the following example, you create a hotkey for the **Smooth Shade Selected Items** function from the **Shading** panel.

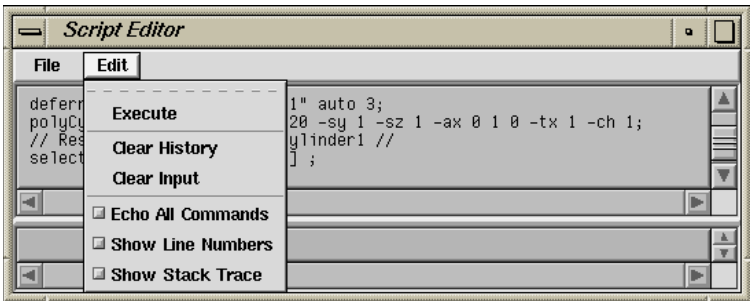
### *To create a hotkey for a panel function:*

1. Select **Window** → **General Editors** → **Script Editor**. The following window appears:

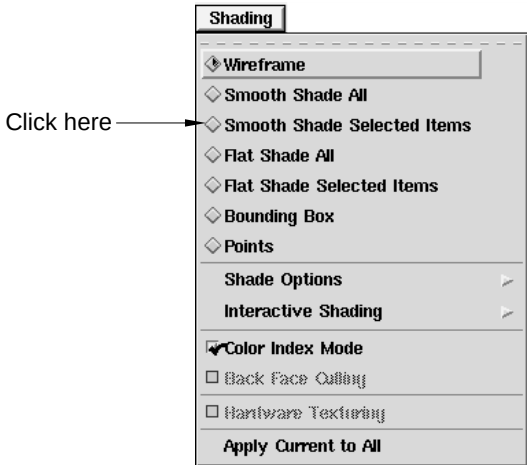
***Tip***

If the Script Editor displays MEL code from previous functions, select **Edit** → **Clear History. This** erases the code from the window.

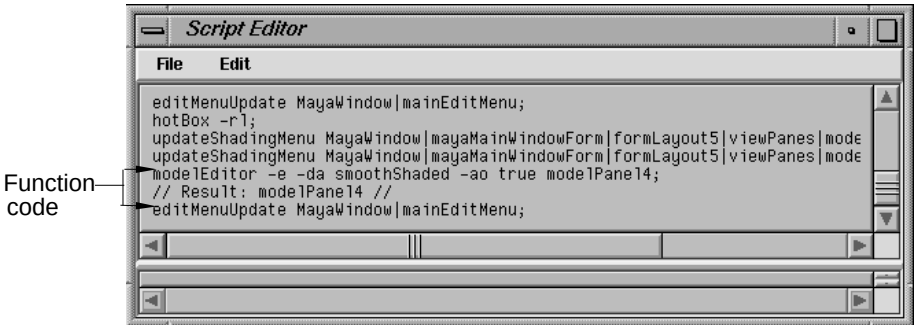
2 Select **Edit** → **Echo All Commands**. This instructs Maya to display all MEL commands used to execute any menu function.




3 Select **Shading**. The following menu appears:

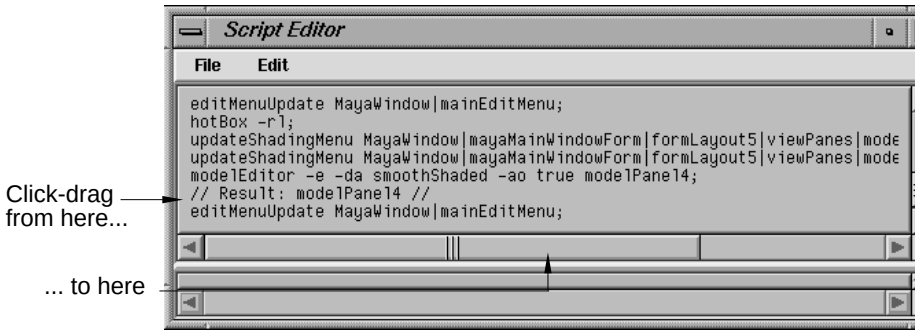



4 Select **Smooth Shaded Selected Items**. Maya echoes the MEL commands in the Script Editor window.

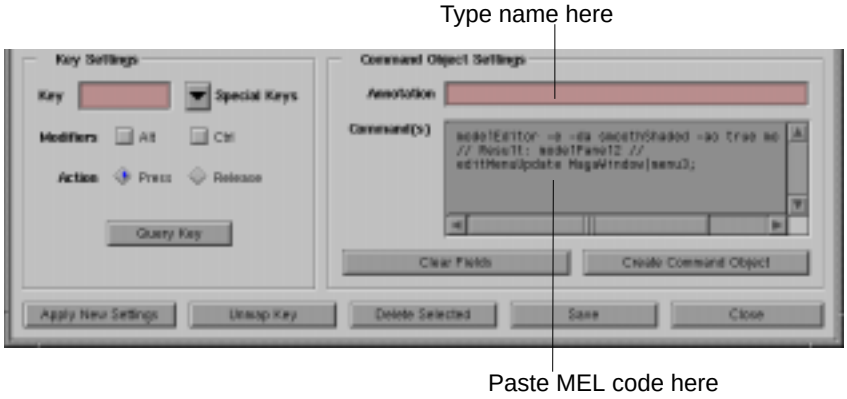



5 Select **Options** → **Customize UI** → **Hotkeys**. The Hotkey Editor window appears.

6 Using the left mouse button, click-drag on the MEL commands in the Script Editor window.




7 Using the middle mouse button, paste the MEL commands into the Command(s) field in the Hotkey Editor window.




8 Enter a name in the **Annotation** box. Use a name that describes the hotkey's function.

9 Select **Create Command Object**. The Hotkeys editor displays the function in the User Defined category.

10 Enter p in the **Key** box, then select **Alt** as the modifier. The default action is **Press**.

**11** Click **Apply New Settings**. The Hotkeys editor displays the function and its hotkey in the User Defined category.

***Hint***

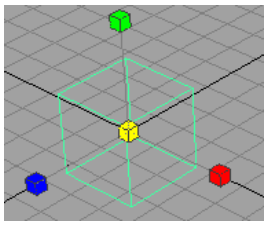
To delete the hotkey, click **Delete Selected**.

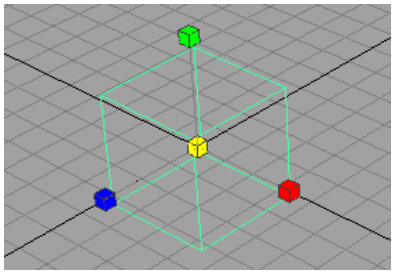
# Feedback Line

The Feedback line is directly above the view menu. It displays information on object transformations. For example, if you scale an object from coordinates 3 3 3 to 3 4 6, the feedback line reflects this change.

Similarly, if you scale the object along the X-axis, the feedback line displays the change. The feedback line also reflects any changes you make using either the Command Line or the Numerical Input Line.

In the following example, the NURBS cube has been scaled along all three axes.





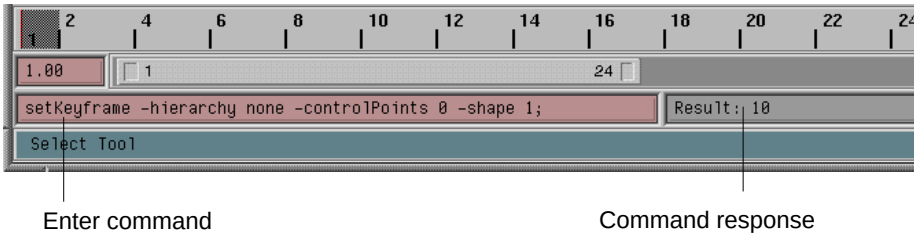
# Numerical Input Line

Use the Numerical input line to enter precise values for transformations. This can give more accurate positions than the mouse. For example, you can enter exact values for moving, scaling, or rotating.

Coordinates entered in the Numerical Input line

# Command Line

You can use the Command Line to enter MEL commands. This can serve as an alternative to using the Maya user interface. Enter commands in the pink area. Any feedback is displayed in the grey area.




# Playback Range

The Playback Range includes the Range Slider and the Time Slider. It represents the current working area for setting up and testing animation.

For more information, see *Using Maya: Animation*.

# 3 Viewing your Scene

This chapter introduces some basic concepts of 3D space. It also includes information on the various tasks you can perform using Maya viewing tools, such as orthographic and perspective views and cameras.

The following topics are described in this chapter:


- "Working in 3D space" on page 55
- "What is a view?" on page 58
- "Setting a perspective view" on page 62
- "Setting an orthographic view" on page 63
- "Arranging the views" on page 65
- "Laying out the views" on page 67
- "Setting a bookmark" on page 68
- "What are manipulators?" on page 73


## Working in 3D space

In traditional character animation, an animator works in a two-dimensional (2D) medium. A character can have length and width, but not depth. Maya lets you work in three dimensions (3D).

### XYZ coordinate space

Maya's 3D coordinate system lets you create characters and scenes with dimensionally accurate values. In the XYZ coordinate system, the origin is the center, with coordinates 0,0,0. All points are defined by one coordinate along the X-axis, one along the Y-axis, and one along the Z-axis.

One direction along each axis is positive and the other direction is negative. You can place points with your mouse, or enter values in the Numerical input line.

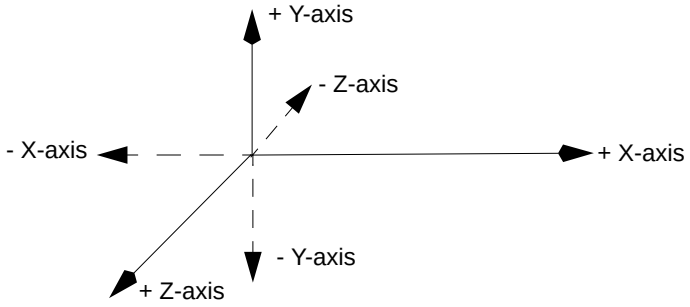
If you are not familiar with working in a 3D environment, you need to know the principles behind the XYZ coordinate system.

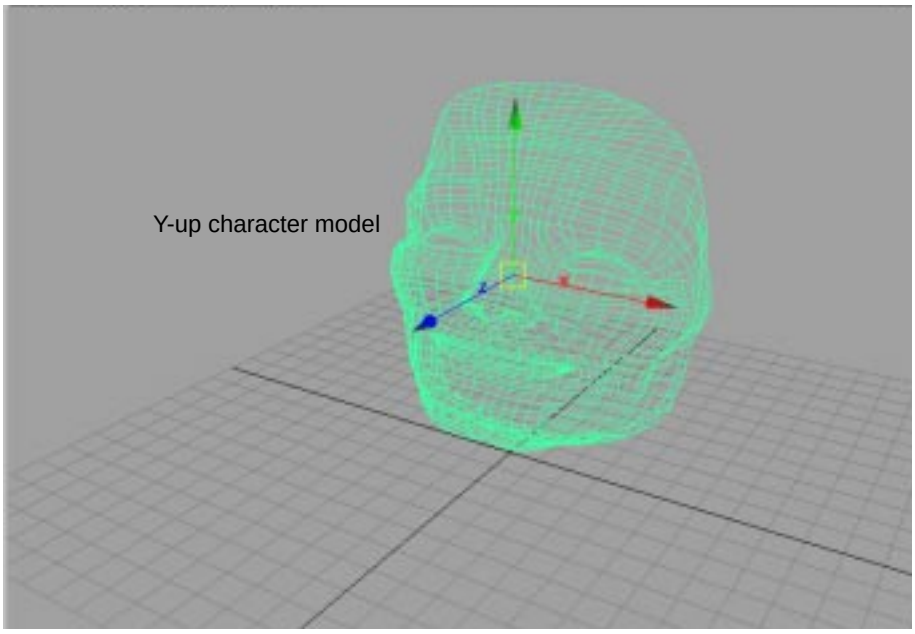
# Orienting the XYZ system

You can orient the XYZ system in either Z-up or Y-up.

## Y-up

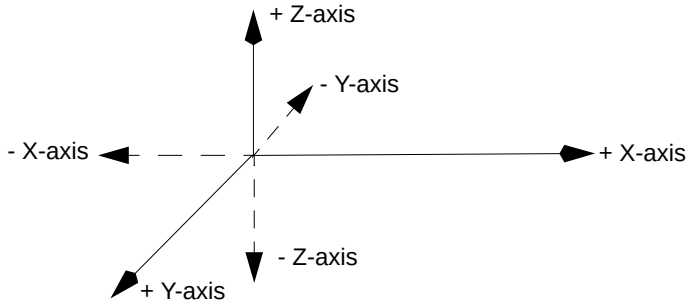
A Y-up world has X set up as the horizontal and Z as the depth of the scene. This orientation is often used by animators (and games developers) who have evolved from the 2D world of vertical (Y) and horizontal (X) to include movement towards or away from the camera (Z).

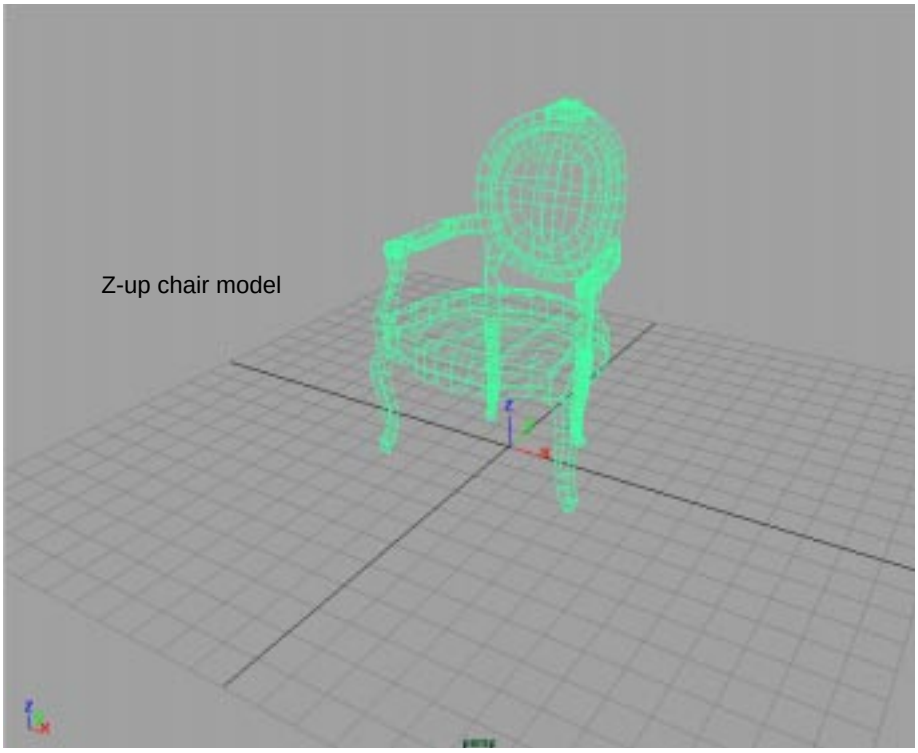


## Z-up

A Z-up world begins with a ground plane that represents the X and Y directions, with Z representing the up direction. This orientation is used by designers, whose main concern is the ground plane where their plans are placed.



### Changing the orientation/up axis

You can change the scene orientation with the **Options** menu or MEL commands. Note that, along with changing the up axis, *every* menu action or tool has an equivalent line command.

#### *To specify the orientation:*

- **Select Options → General Preferences.** Under the World Coordinate System section, select **Y** or **Z**. For more information, see "General options" on page 126.
- To change the orientation to Z-up, enter the following in the Command line:

```
upAxis -ax z
```

- To change the orientation to Y-up, enter the following in the Command line:

```
upAxis -ax y
```

## World coordinates

World coordinates represent space in the view. For example, when you move a camera you move it in terms of world coordinates. The center of the world coordinate system is located at the Origin.

World space is a coordinate system used to represent an object in terms you define. For example, a model car might be defined in terms of millimeters. World coordinates are also known as "modeling coordinates."

## Local coordinates

Local coordinates represent the space around an entity. The origin of a local coordinate system is the center of the entity. The location of the entity in world coordinate is also the location of the entity's local coordination in world coordinates.

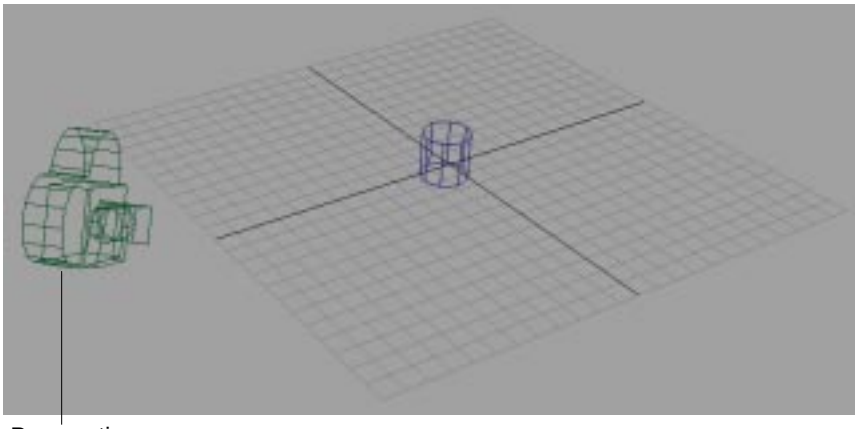
# What is a view?

In Maya, you are always looking through a camera for either perspective or orthographic views. Think of it as being a director on a movie set and looking through a camera lens. Your field of view is restricted to what you can see through that lens. If you want to view the scene from another angle,

you could move the camera you are looking through, but then you would have to move it back again. Instead, you can create, orient, and look through a second camera.

It's the same in Maya. Whatever part of a scene you see depends on the camera you are looking through at the time. You can also use **Look Through Selected** to look through a light or object. For a light, this can help you plan its exact area of illumination. For an object, it can also be a helpful tool. For example, you could select a character's eyes and animate a scene through their view.

In the following example, you are looking at a cylinder through a second perspective camera view.




## Creating a new camera

If you change a view by either tumbling, tracking, dollying, or zooming in and out, you are still looking at the scene or object through the same camera. To look at the scene or object through a second camera, you will have to change the view, then create the camera.

For more information on creating a new camera, see "Setting a bookmark" on page 68.

# Moving the camera

You can move a camera to get a different view of the object without creating a new camera. To move a camera, you can use the Common Tools menu or the mouse with the Alt key.

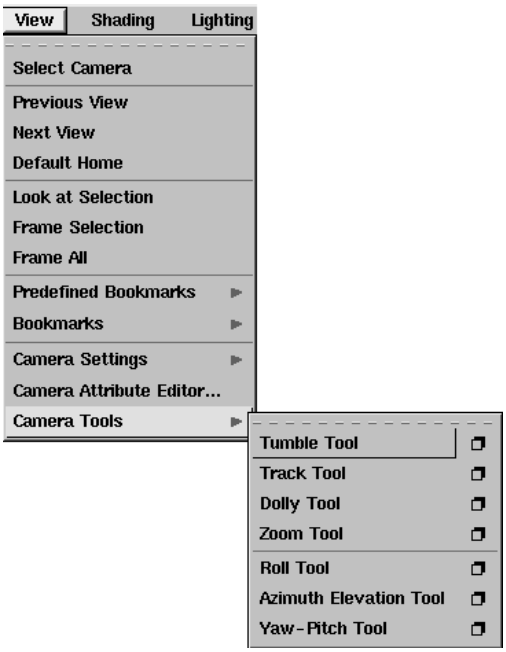
***Note***

To select the **Roll**, **Zoom**, **Azimuth Elevation**, and **Yaw-Pitch** tools, use the Common Tools menu. You cannot select these tools with the mouse and the Alt key.

### *To select a tool:*

1 Select **View** → **Camera Tools**.

The following cascading menu appears:



### *Camera Tools*

| | |
|---|---|
| **Tumble Tool** | Revolves the camera by varying the azimuth and elevation angles in the perspective window. You can also press Alt and the left mouse button. |
| **Track Tool** | When tracking across the display, slides the view either horizontally or vertically. You can also press Alt and the middle mouse button. |
| **Dolly Tool** | Moves into or away from the view. You can also press Alt and the left and middle mouse buttons together.<br><br>You can only use the Dolly tool in a Perspective window. |
| **Zoom Tool** | Changes the focal length on a camera. Zooming in is like using a telephoto lens. Zooming out is like using a wide angle lens.<br><br>You can only use zoom in a perspective view. To move in or out without changing the viewing angle, use the Dolly tool. |
| **Roll Tool** | Rotates the display around its horizontal axis. |
| **Azimuth Elevation Tool** | Revolves the camera about the center of interest in the perspective view. |
| **Yaw Pitch Tool** | Changes from an orthographic view to a perspective view. |

#### *To use a camera tool:*

1. Select the tool you want to use. For information on changing a tool's properties, see "Specifying tool settings" on page 167.
2. Click-drag the left (or middle) mouse button to see the effect of the tool.

## Looking through a camera

To switch the view to a new camera, you can use the **Look Through Selected** action.

#### *To look through a camera:*

1. Select **Panels** → **Perspective**.
2. Select a camera.
3. Select **Panels** → **Look Through Selected**.

***Tip***

You can also use the Hypergraph to select a view. In the Hypergraph window, select the name of a view, then select **Panel** → **Look Through Selected**.

For more information, see *Using Maya: Hypergraph, Sets & Expressions*.

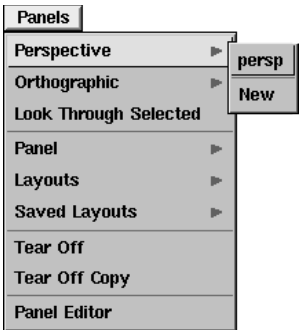
# Setting a perspective view

Each model view is linked to a camera that "looks" at your scene. The camera's position, orientation, and attributes determine what you see through that particular camera.

Use **Perspective** to switch to another perspective camera or create a new perspective view. Unlike with an orthographic view, a perspective view shows depth.

### *To use a perspective view:*

1. Select **Panels** → **Perspective**. The following cascading menu appears:




2. To view a perspective view, select **persp**.

   To create a new perspective camera view based on changes you have made to the display, select **New**.

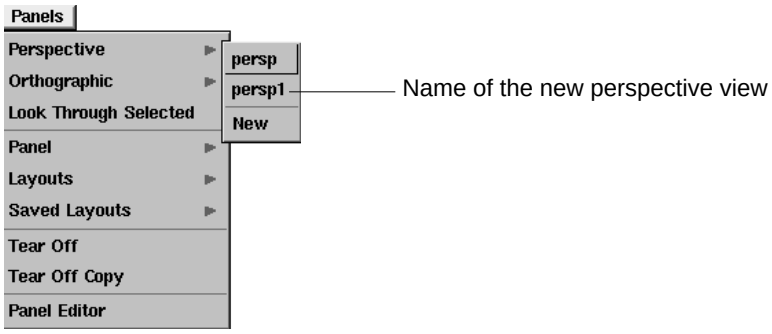
## Creating a new perspective view

When building an object or scene, it is often useful to view the object from several different perspectives. Use the **New** function to create a new perspective camera.

### *To create a new perspective camera view:*

1. Change the view of the object. For example, if you want to tumble the display, press Alt - left mouse button.
2. Select **Panels** → **Perspective** → **New**. Maya creates a new camera in the default home perspective position.
3. To view the original perspective camera, select **View** → **Previous View** or **View** → **Default Home**.

   To view the new perspective camera, select **Panels** → **Perspective**. The following cascading menu appears:



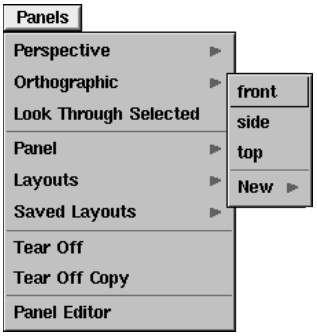

# Setting an orthographic view

An orthographic camera shows the 3D workspace from the top, front, and side views. These views offer the most analytical view of the world space. However, they do not show depth.

Use **Orthographic** to either switch to an orthographic camera or create a new orthographic camera.

### *To switch to an orthographic view:*

1. Select **Panels** → **Orthographic**. The following cascading menu appears:




2 Select **front**, **side**, or **top** as the active window.

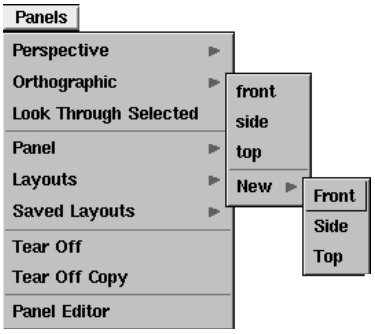
To create a new orthographic camera, select **New**. Maya then places the camera in the active view.

## Creating a new orthographic view

Use **New** to create a new orthographic view.

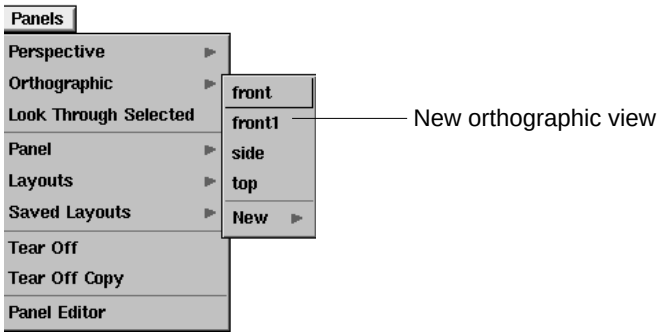
### *To create a new camera view:*

1 Select **Panels** → **Orthographic** → **New**. The following cascading menu appears:




2 Select on the new view — **Front, Side,** or **Top**. Maya changes the view.

3 Select **Panels** → **Orthographic**. The view you just created appears in the following cascading menu:




# Arranging the views

Use **Panels** to change a camera view or to view a scene or object through a selected camera.

### *Display Panel selections*

Select **Panels**. The following cascading menu appears:

- **Perspective** — lets you change to a perspective view or to create a new view.
- **Orthographic** — lets you change a perspective view to orthographic, select a new orthographic view, or create a new orthographic view.
- **Look Through Selected** — lets you look through a selected camera, object, or light.
- **Panel — displays a cascading menu, which contains the following tools:**

**Outliner** — lets you see objects and their attributes from a high-level perspective. For more information, see Chapter 14, "Outliner."

**Graph Editor** and **Dope Sheet** — let you edit keys, motion tangents, and animation curves. For more information, see *Using Maya: Animation*.

**Hypergraph** — gives you an overview of your entire scene, all objects it contains, and the relationships between those objects. For more information, see *Using Maya: Hypergraph, Sets & Expressions*.

**Texture View** — lets you map textures to a polygonal model. For more information, see *Using Maya: Modeling*.

**Multi-Lister**, **Render View**, and **Shading Group Editor** — let you create and edit rendering nodes, assign shading groups to geometry, preview a rendered image, and key animatable rendering attributes. For more information, see *Using Maya: Rendering*.

**Set Editor** — lets you group and manipulate objects as sets. For more information, see *Using Maya: Hypergraph, Sets & Expressions*.

**Blend Shape** — lets you create character deformations. For more information, see *Using Maya: Animation*.

**Dynamic Relationships** — shows the connections between dynamics elements such as particle emitters, collisions, and so on. For more information, see *Using Maya: Animation*.

**Devices** — lets you use external tools and plug-ins for special devices, such as Motion Capture.

- **Layouts** — lets you specify how different camera views appear in the Maya window.
- **Saved Layouts** — displays the current layouts set up in the Panel Editor.
- **Tear Off** — copies the current camera view.
- **Tear Off Copy** — copies a camera view, beginning with the current view and ending with the last camera view.
- **Panel Editor** — opens the Panel Editor, which lets you create new panels, relabel existing panels, rename layouts, and change layout configurations.

# Laying out the views

Because much of your 3D work takes place in a modeling view window, you want to be able to view an object from the top, front, side, and in perspective. In 3D, it is sometimes difficult to see exactly where an object lies. The four views enable you to confirm the positioning of objects from more than one camera angle.

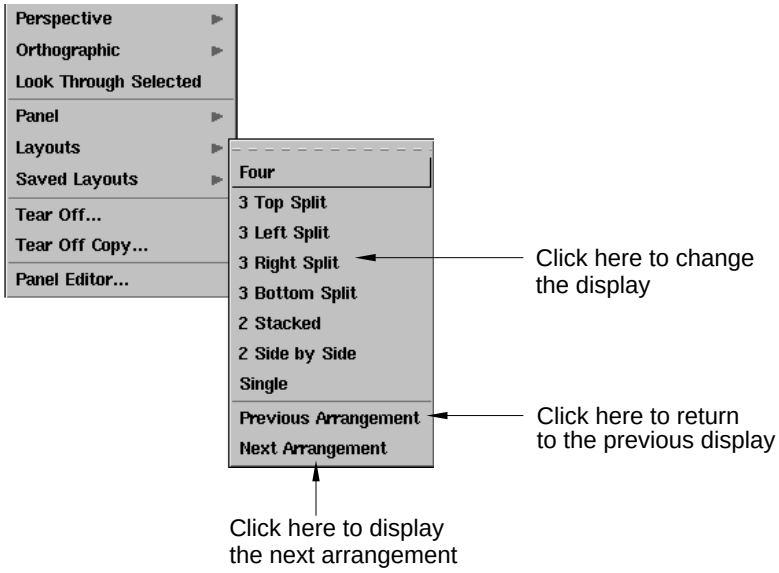
Use the **Viewing Pane Arrangement** to control how Maya displays the four basic views. The top, front, and side views are 2D orthographic views that allow you to view your work analytically. The fourth view is perspective and allows you to view the scene in 3D.

You can place any tool in a view. For more information, see "Assigning panels" on page 172.

In the following example, the display is changed to a 3 left split layout.

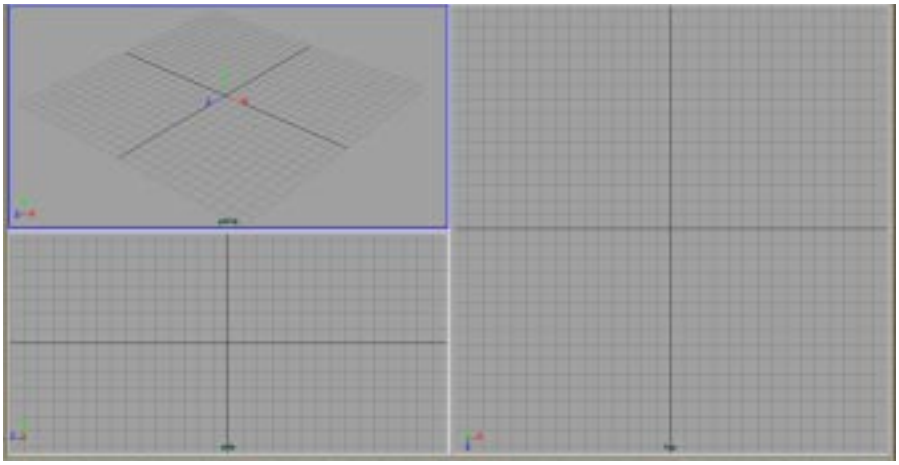
### *To set the views:*

1 Select **Panels** → **Layouts.** The following cascading menu appears:




2 Select **3 Left Split**.

The Maya window changes to the following three views:



You can now view an object or scene in three different views.

***Tips***

If you want one view to occupy the entire Maya window, select the view, then press the space b**ar** quickly. (If you press the space bar for too long, Maya displays the HotBox.)

To switch to a perspective view, select **Panels** → **Perspective**.

To switch to another orthographic view, select **Panels** → **Orthographic** → and the name of the orthographic panel you want selected.

To rename and delete a camera, use the Outliner. See Chapter 14, “Outliner.”

# Setting a bookmark

You can use **bookmarks** to mark a view for later use. This lets you maintain a number of key points of view for any scene. Maya has four predefined bookmarks. These are the same as the perspective and orthographic views. **Use Predefined Bookmarks** to change the perspective of an object.

***Note***

You cannot change positions for the predefined bookmarks.

### *Changing the view to a predefined bookmark:*

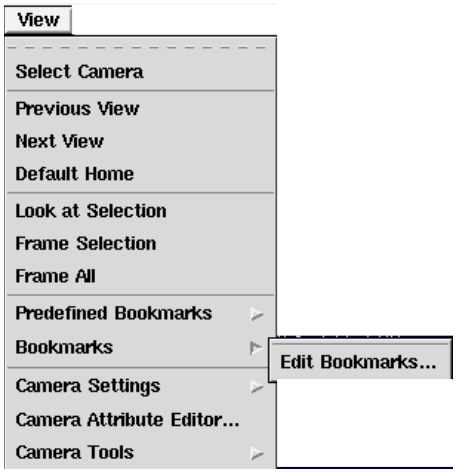
Select **View** → **Predefined Bookmarks**. A cascading menu opens from which you can choose one of the standard default views: *Perspective*, *Front*, **Top**, and *Side*.

# Creating a bookmark

### *To create a new bookmark:*

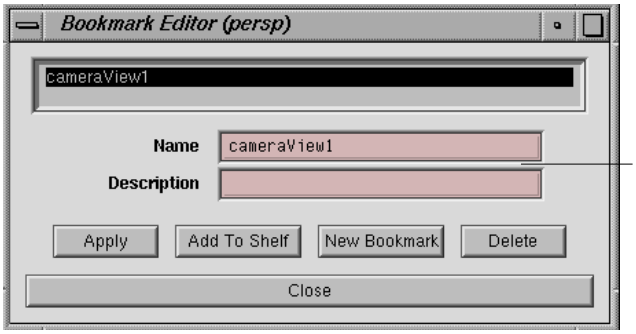
1. Select an object and change the view.
2. Select **View** → **Bookmarks**.

   The following cascading window menu appears.




3. Select **View** → **Bookmarks** → **Edit Bookmarks**.

   The following window appears:




4 Type the name of the new bookmark and select **Apply**.

5 To access the new bookmark, select **View** → **Bookmarks**.

6 Select the bookmark that you want to view the object through.

***Tip***

To create a bookmark with system- assigned name, select **Edit Bookmarks**, the Bookmark Editor appears, and click **New Bookmark**.

Maya assigns the view to the first bookmark under the name **cameraView1**.

## Deleting a bookmark

You delete a bookmark from the command line or the Multilister.

### *Enter the following command from the Command Line*

```
delete <bookmarkname>
```

Where <bookmarkname> is, enter the name of the bookmark you want to delete.

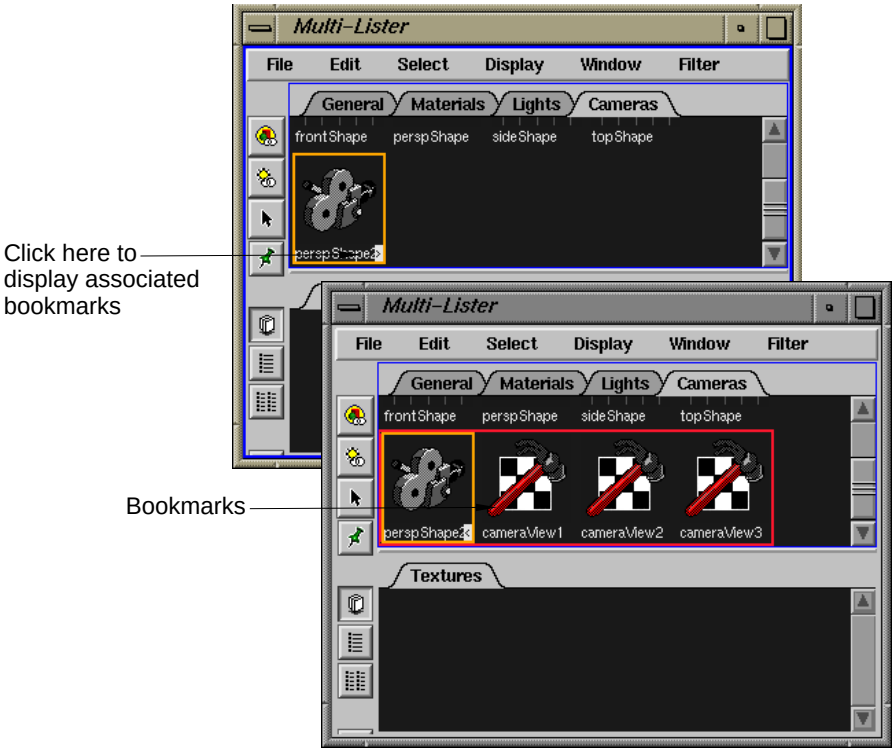
### *From the Multilister*

1 Select **Window** → **Multilister**.

The following window appears:

2 Click the **Cameras** tab.

The following window appears:




3 Click the bookmark you want to delete.

4 Select **Edit** → **Delete Highlighted** from the Multilister menu.

Maya removes the bookmark from the window.

5 To undo the deletion, select **Edit** → **Undo**.

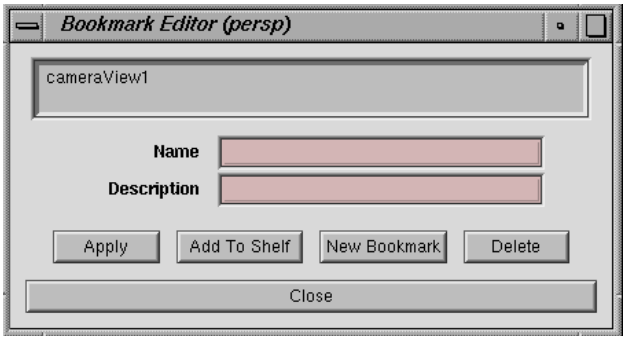
## Changing a bookmark's name

You can change the name of a bookmark.

### *To change the name of a bookmark:*

1. Select **View** → **Bookmarks** → **Edit Bookmarks.**
2. Select the name of the bookmark you want to change.

   The following window appears:

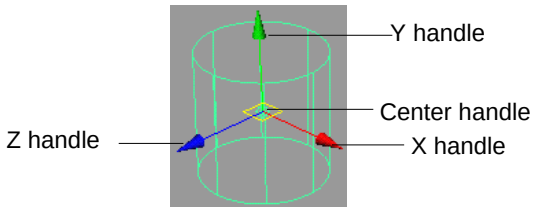



3. Enter the new name of the bookmark, then click **Apply**.
4. To view the renamed bookmark, select **View** → **Bookmarks**. A list of bookmarks appear. Select the renamed bookmark.

# What are manipulators?

A manipulator lets you edit the parameters or attributes of an object. For example, you can use a manipulator to change the sweep angle of a revolved surface. Manipulators give you a visual and interactive way to change parameters.

Manipulators are used by a variety of tools in Maya. Usually, a manipulator is created by a tool and then deleted when you exit the tool. However, there are some exceptions to this.




### Handles:

A manipulator is made of several handles. For example the move manipulator has a center handle, plus handles to move it in X, Y and Z.

You can change handle sizes with the manipulators display preferences in **Options** → **General Preferences**. For the transform manipulator, you can change the overall size of the manipulator in this property sheet. You can also use the + and - keys on the keyboard to change the size of the transform manipulators.

### The active (current) handle

When you click-drag a manipulator handle, it becomes the active handle. This means you can use the middle mouse button, to move the handle without having to reselect it. If you click down away from the handle and drag, it still moves the manipulator.

### The active handle is drawn in yellow

You can keyframe the attribute corresponding to this active handle. See the set keyframe menu item for more details.

### Numerical input and feedback

When a manipulator is active, the parameters that the manipulator is changing are shown in the Feedback Line. Also, you may enter in the values into the Numerical Input Line at the top right of the window.

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